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MONOGRAPH

OF THE

LACERTIDÆ

BY

GEORGE ALBERT BOULENGER

LL.D., D.Sc., F.R.S.

Smithsonian Institution
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National Museum

VOLUME I

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PREFACE.

The aims and objects of this Monograph are so fully and lucidly described by the author in his Introduction that it is unnecessary for me to attempt to re-state them. The results of Dr. Boulenger's ripe experience, based as they are on the examination of an enormous amount of material, will certainly be of great value to his fellow-workers in the same field. The Trustees of the British Museum have already published a long series of important Catalogues prepared by him, on Fishes and Batrachians as well as on Reptiles; and, on the eve of his approaching retirement, they have informed him of their high appreciation of the value of his services. It remains to me to express my great regret that this Monograph is the last which can be expected to be produced by him in his official capacity as a member of the staff.

The thanks of the Trustees are due to the numerous donors of the specimens on which this work is largely based, as well as to those who have lent specimens or have assisted the author in any other way. The names of the principal helpers are stated in the Introduction and repeatedly in the text, while those of other donors will be mentioned in the list of specimens which is to appear at the end of the second and concluding volume.

Sidney F. Harmer,
Keeper of Zoology.

British Museum (Natural History),
London, S.W. 7.
May, 1920.

INTRODUCTION.

The words of Cuvier, with which Milne-Edwards headed his 'Recherches zoologiques pour servir à l'histoire des Lézards,' the first scientific attempt to deal with the Lacertidæ, in 1828, remain appropriate to this day: "La détermination précise des espèces et de leurs caractères fait la première base sur laquelle toutes les recherches d'histoire naturelle doivent être fondées." But I feel sure neither of these great masters in the early days of Zoological Science realized the extent of the material needed to achieve such an object.

I trust the descriptions in this book, with special references to individual variations, so often left out of consideration by systematists, or alluded to in a more or less vague manner, as well as the tables giving precise data concerning the extent of numerical variation in the lepidosis, will prove of lasting value. Results derived from such a vast material as it has been my privilege to examine, far surpassing any ever brought together before, should be worthy of the attention even of those workers in the same field who would disagree with the manner in which they have been utilized in the elaboration of this monograph.

Recent attempts at multiplying species by the use of characters which can be shown to be untenable when sufficient series of specimens are available, are only to be set right by the course here followed; it is besides of the greatest importance, from the phylogenetic point of view,

to ascertain, as our knowledge progresses, what extent of variation a given form is susceptible of, and in what direction variation tends.

When referring to works of descriptive Zoology and Botany, I have frequently been disappointed at finding that definitions of common species, of which I could bring together large series of specimens, even from a single locality, were far from covering the amount of variation, and I have often wished to see descriptions drawn up that would answer such a requirement; I do not, of course, allude to malformations or the like, but to characters such as, without being regarded as absolutely diagnostic, are nevertheless used in the definitions. The reason for this shortcoming appears to be, either that the author has not thought it worth his while to test every one of the characters on as large a series as he could get hold of, or that he has purposely omitted any allusion to departures from the normal in order not to obscure the conception of the species. As regards numerical variation, descriptions, if giving consideration to the matter at all, are usually restricted to an indication of the extremes.

The imperfections of this work are no doubt numerous, and will be pointed out in due course by others, but I feel sure those who use it will find that every effort has been made to render the descriptions as comprehensive and accurate as the available material permitted.

The phylogenetic speculations which appear in this monograph, making it something more than purely descriptive, need apology in these days of scepticism concerning all theories of evolution. I believe it is possible to discover the tendencies of each group to evolve in a particular direction, and then to decide what characters have been modified or lost and what new ones have been produced. The way in which a combina-

tion of orthogenetic and adaptative modifications have led to various parallel series in this family is a subject of philosophical interest too evident to be passed over without comment; and if the interpretation of these evolutionary series is at all sound, a step will have been made in the advancement of our knowledge, and a more rational basis laid down for the discussion of the probable mode of geographical dispersion of the genera, species and varieties.

As in the past, I have been guided by broad views on the conception of species, feeling that they are conducive to a better understanding of the subject, to a truer picture of the state of things in Nature. Whilst not losing sight of resemblances, I attach the fullest importance to the recognition of minor forms or subspecies, which I designate as varieties, in accordance with the Linnean practice—there being no need to depart from it.

The material on which this monograph is based is, of course, preserved mainly in the British Museum, to which the important private collection of my fellow-worker and adviser in the early days of my career, M. Fernand Lataste, has been recently added through his friendship and generosity. I have also utilized many specimens lent to me by the late Dr. J. de Bedriaga, whose name will ever be associated with the Lacertidæ, Dr. F. Werner, M. H. Gadeau de Kerville, Dr. L. Péringuey (South African Museum), Dr. R. Gestro (Genoa Museum), Dr. N. Annandale (Indian Museum), Miss Wilman (McGregor Museum), Mr. A. Loveridge (Nairobi Museum), and Dr. R. F. Scharff (Dublin Museum). Thanks to the kindness of Prof. L. Roule and Dr. C. Gaillard, I have been able to avail myself for study of the collections in the Paris and Lyons Museums.

The indications for the specimens in public or private

collections other than the British Museum are marked with the following initials in the tables of particulars :—

B.C. Bedriaga Collection.
B.M. Brussels Museum.
B.S. Bombay Nat. Hist. Society's Museum.
D.M. Dublin Museum.
F.M. Florence Museum.
G.K.C. Gadeau de Kerville Collection.
G.M. Genoa Museum.
I.M. Indian Museum, Calcutta.
L.M. Lyons Museum.
M.C. L. Müller Collection.
McG.M. McGregor Museum, Kimberley.
N.M. Nairobi Museum.
P.M. Paris Museum.
S.A.M. South African Museum, Cape Town.
T.M. Turin Museum.
W.C. Werner Collection.

In addition to those mentioned above as having helped me with material for study, I wish to thank M. G. de Southoff, who has recently presented to the British Museum a fine series of Lizards, mostly from Italy and the islands of the Mediterranean, selected from his private collection.

Various parts of this monograph have already appeared in the publications of the Zoological Society and elsewhere, and are reproduced with additions and emendations.

This monograph will form two volumes; the second is ready for printing, and it is hoped it may follow without much delay, with a list of the specimens in the Museum, and an alphabetical index to the whole work.

G. A. Boulenger.

Zoological Department,
British Museum;
20th April, 1920.

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MONOGRAPH

OF THE

LACERTIDÆ.

Family LACERTIDÆ.

The Lacertidæ may be defined as strictly pleurodont, coelodont lizards with the tongue flat, elongate, bifid in front and behind, and covered with rhombic scale-like papillæ or overlapping oblique plicæ converging forwards; with the premaxillary bone single, the nasal and frontal paired, the parietal single, complete post-orbital and postfronto-squamosal arches, roofing over the supratemporal fossa, palatines and pterygoids separated on the median line, and with bony dermal plates completely fused with the cranial bones when in contact with them; with the clavicle dilated and perforated proximally, and the interclavicle cruciform; without dermal ossifications on the body; with symmetrical shields on the upper surface of the head; with the ventral lepidosis usually well differentiated from the dorsal; and with the lower surface of the thighs usually bearing a series of pores. This family does not present any cases of reduction of the limbs, or of the visual or auditory organs.

The present work contains descriptions of 145 species, referred to 22 genera, defined in the following Synopsis.*

* 97 species, referred to 17 genera, were recognised in the last general account of the Family (Cat. Liz. iii, 1887). 43 species and 9 genera were known to the authors of the Erpétologie Générale (1839).

As in all classifications dealing with a large number of genera, these cannot be disposed in a linear series, and one must therefore not be surprised to find *Nucras* and *Eremias*, although nearly completely connected, placed as Nos. 1 and 18 in the series, or *Lacerta* and *Tachydromus*, to which the same remark applies, as Nos. 2 and 11. What I believe to be the natural relationships of each is mentioned in every case after the generic definition, and for the principles which have guided me in the phylogenetic comments I must refer especially to the remarks on *Lacerta* and *Nucras*, first published in 1916 (Tr. Zool. Soc. xxi) and 1917 (Ann. S. Afr. Mus. xiii), and here reproduced, with slight alterations, after the definitions of these two genera.

Synopsis of the Genera.

I. Ventral plates smooth; collar strongly marked; digits not serrated laterally; subdigital lamellæ smooth or tubercular, except in some specimens of *Philochortus*, in which they are keeled.

Nostril pierced between two or three nasals, separated from the first upper labial; dorsal scales small, juxtaposed . . . . . 1. *Nucras*, Gray.

Nostril pierced between two or three nasals and the first upper labial, or separated from the latter by a narrow rim; dorsal scales small or moderate, juxtaposed or subimbricate . . . . . 2. *Lacerta*, Linn.

Nostril pierced between two or three nasals and the first upper labial, or separated from the latter by a narrow rim; dorsal scales large, imbricate, strongly keeled . . . . . 3. *Algiroides*, Bibr.

Nostril pierced between two nasals and the first upper labial, or separated from the latter by a narrow rim; back with two to six longitudinal series of enlarged plate-like scales . . 4. *Philochortus*, Matschie.

II. Ventral plates smooth; collar more or less distinct; subdigital lamellæ keeled; scales small, at least on anterior part of back.

Nostril pierced between three to five nasals and the upper labial, or separated from the latter by a narrow rim; digits not serrated laterally; occipital present . . . . . 5. *Latastia*, Bedr. 7

Nostril pierced between two nasals and the first upper labial; digits serrated laterally; occipital absent, or reduced to a granule . . 6. *Acanthodactylus*, Wiegm. 7

III. Ventral plates keeled, at least the outer; collar usually well marked, rarely absent; subdigital lamellæ smooth or tubercular.

A. African genera. 10 to 15 femoral pores on each side.

Nostril pierced between two nasals; dorsal scales small, juxtaposed . . . . . 7. *Gastropholis*, J. G. Fisch.

Nostril pierced between two nasals and the first upper labial; scales large, rhombic, imbricate, keeled. 8. *Bedriagaia*, Blgr.

Nostril pierced between three nasals and the first upper labial; back with large, plate-like, subimbricate scales with strong keels forming continuous lines. 9. *Poromera*, Blgr.

B. E. Asian. 1 to 5 femoral pores on each side*; nostril pierced between two or three nasals and the first upper labial.

Dorsal scales small, equal, hexagonal, keeled. 10. *Apeltonotus*, Blgr.

Back with large plate-like subimbricate scales with strong keels forming continuous longitudinal lines; digits subcylindrical or slightly compressed. 11. *Tachydromus*, Daud.

Back with large plate-like scales as in the preceding; digits slightly depressed, with large transversely elliptic lamellæ inferiorly, the distal joint compressed and bent at an angle . . . . 12. *Platyplacopus*, Blgr.

* These pores, when reduced to 1 or 2, have been termed "inguinal."

IV. Ventral plates smooth; collar absent or feebly marked; subdigital lamellæ keeled, except in *Tropidosaura* and some species of *Psammodromus*; dorsal scales large or rather large, rhombic or lanceolate, strongly keeled.

A. Lower eyelid opaque, with numerous scales in the middle.

Nostril pierced between two or three nasals; digits with smooth or tubercular lamellæ inferiorly. 13. *Tropidosaura*, Fitz.

Nostril pierced between two nasals and the first upper labial or separated from the latter by a narrow rim; digits with smooth, tubercular or keeled lamellæ inferiorly . . . . 14. *Psammodromus*, Fitz.

Nostril pierced between two or three nasals; digits with keeled lamellæ inferiorly . . 15. *Ichnotropis*, Peters.

B. Lower eyelid with a very large transparent disc.

Lower eyelid distinct from the upper . . 16. *Cabrita*, Gray.

Lower eyelid fused with the upper . . 17. *Ophiops*, Ménétr.

V. Ventral plates smooth; collar present or absent; subdigital lamellæ keeled, or digits fringed laterally; dorsal scales small; nostril well separated from the first upper labial.

Digits not distinctly serrated laterally; collar more or less distinct; femoral pores . . . 18. *Eremias*, Wiegm.

Digits serrated or fringed laterally; collar distinct; femoral pores . . . . . 19. *Scaptira*, Wiegm.

Digits fringed laterally; collar distinct; no femoral pores . . . . . 20. *Macmahonia*, Blgr.

Digits fringed laterally; no collar; no femoral pores. 21. *Aporosaura*, Blgr.

VI. No frontoparietals; two series of large smooth plate-like scales along the back and tail; digits serrated laterally; tail much depressed, fringed laterally . . . . . 22. *Holaspis*, Gray.

Distribution.

Europe and Asia to the northernmost limit of Reptilian life, eastward to Saghalien and Japan, southward to Borneo, Java, Sumatra and Ceylon; Africa, exclusive of Madagascar and the Seychelles.

Europe, Asia, Africa: *Lacerta, Acanthodactylus, Ophiops, Eremias.*

Europe, Africa: *Algiroides, Psammodromus.*

Asia, Africa: *Philochortus, Latastia, Scaptira.*

Asia: *Apeltonotus, Tachydromus, Platyplacopus, Cabrita, Macmahonia.*

Africa: *Nucras, Gastropholis, Bedriagaia, Poromera, Tropidosaura, Ichnotropis, Aporosaura, Holaspis.*

Palæarctic Region: *Lacerta, Algiroides, Latastia, Acanthodactylus, Apeltonotus, Tachydromus, Platyplacopus, Psammodromus, Ophiops, Eremias, Scaptira, Macmahonia.*

Oriental or Indo-Malay Region*: *Tachydromus, Cabrita, Ophiops.*

Ethiopian Region: *Nucras, Lacerta, Algiroides, Philochortus, Latastia, Acanthodactylus, Gastropholis, Bedriagaia, Poromera, Tropidosaura, Ichnotropis, Eremias, Scaptira, Aporosaura, Holaspis.*

Including, of course, the genus *Nucras*, now restricted to Tropical and South Africa, but which there is reason to believe was represented in Europe in the Oligocene period, all the Ethiopian genera may be looked upon as derived from Palæarctic forms; although equally numerous, and even more diversified, *Aporosaura* and *Holaspis* being the most aberrant of the family, there is every reason to regard them as modifications of more northern types. As to the very poor Indo-Malay Lacertid fauna, all except *Cabrita* are obviously mere streamers from the Palæarctic fauna, and, from theoretical considerations, we may say the same of *Cabrita*. If we consider the present composition of the Palæarctic fauna, the conclusion is reached that the centre from which the members of the family have radiated from very early times corresponds roughly to what is now S.E. Europe, Asia Minor, and Transcaucasia, where several primitive forms have maintained themselves.†

* As defined by Blanford, Phil. Trans. cxliv, 1901, p. 432, who regarded the Punjab and Sind, with Western Rajputana and Baluchistan, as the south-eastern extremity of the Mediterranean subregion of the Palaearctic region, extending westward, through Persia and Arabia, to the Sahara.

† In accordance with the theory of "oriental migration" supported by A. Engler, Vers. Entw. Pflanzenw. i (1879), and by R. Scharff, History of the European Fauna, p. 245 (1899).

I have always objected to the recognition of zoogeographical primary divisions except for restricted groups, on the ground that whilst they apply to one group they do not, or may even be radically opposed, to another, even of the same class or order. In the case of the present family the Old World stands quite apart from the New, no doubt because the extension to Northern Asia is comparatively recent, and it is clear that there is no boundary at all to be drawn for the three generally accepted great divisions in which they are represented. There is no reason for regarding Arabia and the countries to the West of the Red Sea as Palæarctic rather than Ethiopian, whilst the character of the Indo-Malay fauna is merely negative. That is why, in the above list, I have given precedence to the divisions according to ordinary physical geography.

One striking fact is the nearly absolute concordance in the distribution of the Lacertidæ and the true Vipers (Viperinæ), except for the absence of the latter from various large islands in Europe (Ireland, Corsica, Sardinia) as well as in Asia (Japan, Loo Choo, Formosa) and from China. The northernmost species of the two groups, *Lacerta vivipara* and *Vipera berus*, have an almost identical range. The Palæarctic–Ethiopian distribution of the *Lacertidæ* and *Viperinæ* is in striking contrast with that of the *Anguidæ*, *Scincidæ*, *Colubrinæ*, and *Crotalinæ*, the Palæarctic forms of which show Nearctic affinities, the more pronounced as we proceed from West to East. It is noteworthy that the two most generalised genera, *Nucras* among the Lacertids, *Causus* among the Vipers, are now confined to Tropical and South Africa; Palæontology may some day enlighten us as to their northern origin, which I regard as highly probable.*

At present we are in the dark as to the immediate ancestors of the Lacertidæ; we may, however, provisionally regard them on theoretical grounds as derived from the Teiidæ, now confined to America, but which may have had representatives in the Old World in Eocene times, and which appear to be at least as old as the Cretaceous (*Chamops*, Marsh, from the Laramie of Wyoming). These two families are closely related, the former differing from the latter in the dermal ossification over the skull and the ultra-pleurodont dentition, characters expressive of a more advanced evolution.

* *Cf.* G. A. Boulenger, Considérations sur les affinités et la dispersion géographique des Lacertides. C. R. Ac. Sc. Paris, clxvi, 1918, p. 594.

1. NUCRAS.

Nucras, Gray, Ann. N. H. i, 1838, p. 280; Lataste, Ann. Mus. Genova (2), ii, 1885, p. 124; Boulenq. Cat. Liz. iii, p. 52 (1887), and Ann. S. Afr. Mus. xiii, 1917, p. 195.

Lacerta, part., Dum. & Bibr. Erp. Gén. v, p. 174 (1839); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 24.

Nucras, part., Gray, Cat. Liz. p. 33 (1845).

Zootoca, part., Gray, op. cit., p. 27.

Bettaia, Bedriaga, t.c., p. 435.

Head-shields normal. Nostril well separated from the labials, pierced between two or three nasals. Lower eyelid scaly. Collar well-marked. Dorsal scales small; ventral shields feebly imbricate, smooth. Digits cylindrical or very feebly compressed, with smooth lamellae inferiorly. Femoral pores. Tail long, cylindrical.

Tropical and South Africa.

When, nearly 30 years ago, the late Dr. R. Klebs submitted to me the oldest known Lacertid (Oligocene) with the lepidosis preserved through imbedding in amber, a careful comparison with recent lizards led me to refer it to the genus *Nucras*, although the essential generic character of the position of the nostril could not be ascertained, my conclusion being based on an examination of the digits and of the scaling of the gular and pectoral regions, more similar to those of *Nucras tessellata* than of any other lizard with which I was acquainted.* Since then I have made a more thorough study of the Lacertidæ from the point of view of their probable evolution, and independent, correlative reasons have confirmed my provisional identification so far that, quite apart from any palæontolgical consideration, I am now inclined to regard *Nucras* as, on the whole, the most primitive genus of the Lacertidæ. At the time I examined the lizard in amber the representatives of the genus were believed to be confined to Africa no further north than the Zambesi basin, and my suggested identification may, therefore, have seemed somewhat risky from the standpoint of zoogeography. We must, however, bear in

* *Cf.* R. Klebs, Schrift. Phys.-oek. Ges. Königsberg, li, 1910, p. 227. I have since proposed to designate the lizard as *Nucras succinea*.

mind that, in Tertiary times, the general character of the reptile fauna of the northern parts of what is now the Palæartic Region differed very strongly from that of the present day. Iguanidæ, now confined to the New World, Fiji, and Madagascar, occurred in the Miocene of Europe, and the Pelomedusid Chelonians, at the present time found only in Tropical and South Africa, Madagascar and South America, were represented in the Eocene as far north as England. Within the last fifteen years the range of *Nucras* has been ascertained to extend further to the north in Africa (Lake Victoria), and, in accordance with the view of the probable origin of these lizards, the northernmost species (*N. emini*) has every claim to be considered, from the morphological standpoint, as the most primitive of the genus. I therefore believe that *Nucras* had a northern origin—an opinion further supported by the fact that the Lacertidæ, like the Agamidæ, being absent from Madagascar, must have extended their range towards the south after the connexion of Africa with that island had been severed, whilst the presence of Iguanidæ, Gerrhonotidæ and Chamæleontidæ may be explained by these having reached Madagascar from Africa at a period previous to the southern extension of the Lacertidæ and Agamidæ.

The reasons for regarding the genus *Nucras* as the most primitive of the Lacertidæ are the same as set forth in my remarks on the derivation of the species of *Lacerta* (p. 29), in which *L. agilis* is held to be the surviving representative of the ancestor of most if not all of the species of the genus *Lacerta* with which we are at present acquainted. Of the 10 characters, or sets of characters, there mentioned, 8 are in accordance with this view, the only two (7, 9) pointing to *Nucras* as not so primitive being the reduction of the dorsal lepidosis to smooth granules and the long tail,* in which all the species at present known agree. Otherwise we find (1) constant presence of teeth on the palate; (2) a non-depressed or feebly-depressed skull of moderate ossification (no supraorbital fontanelle, no dermal ossifications in the temporal region), although less primitive than that of *L. agilis*, owing to the narrower internarial space (comparable to *L. vivipara* in *N. delalandii*, to *L. muralis* in *N. tessellata*); (3) presence, in some forms at least, of the foramen parietale; (4) nostril between two or three nasals, the first upper labial being well separated from it, and absence, in some species, of small scales between the supraoculars and the

* Unless it be true that the tail of *N. boulengeri* is only 1½ to 1¾ times the length of head and body, as stated in the original description; but it is not improbable that the fact of the organ being in a regenerated condition has been overlooked.

superciliaries; (5) lower eyelid without transparent disc; (6) no denticulation in front of the ear-opening; (8) cylindrical or feebly compressed digits with smooth lamellæ inferiorly; (10) the ideal type of primitive markings in some forms, no vivid colours on the head or body.

The main principles of the evolution of markings, as held by me, are well supported by a study of the genus *Nucras*, which embraces striated, ocellated, and barred forms. The most primitive pattern, with 11 light longitudinal streaks, at least anteriorly, occurs in *N. intertexta*, var. *holubi*, and in *N. tessellata* (*tæniolata*, Smith). In the latter species the markings may vanish towards the posterior part of the body and the streaks on the sides break up into spots, and, further, rearrange themselves into cross-bars, as happens also in *N. intertexta*, var. *holubi*. The dorsal striation may disappear and lead to ocellated forms (*N. intertexta*, typica). The most pronounced ocellar pattern, accompanied by the loss of the longitudinal streaks, is exemplified by *N. delalandii*, in which, further, the ocelli may disappear, to be replaced by black cross-bars.* As a rule, the white longitudinal streaks are more numerous on the nape than on the body, but I find one individual exception in a typical *N. tessellata*, where three dorsal streaks are present on the nape and four on the body.

There are two important points in which the striation in *Nucras* differs from that in *Lacerta*: (*a*) the outer light dorsal streak, instead of starting from the superciliary edge, originates on the border of the frontal shield and then follows the supraorbital border and the parietal shield; (*b*) the vertebral streak, instead of ending on the base of the tail, may be continued a considerable distance along that organ—a primitive condition in accordance with Eimer's law.

Synopsis of the Species.

I. No small scales between the supraoculars and the superciliaries, or one to three exceptionally present; head not or but little broader than deep; 16 to 22 lamellar scales under the fourth toe.

Head 4 to 5 times in length to vent†; foot as long as or a little longer than head; parietal foramen present; 40 to 51 scales across middle of body; ventrals in 28 to 32 transverse series; transversely enlarged plates under the fore-arm.

1. *N. emini*, Blgr., p. 10.

* *Cf.* Ann. S. Afr. Mus. xiii, 1917, pls. vi and vii, where the principal patterns of markings have been figured.

† The head is measured to the posterior border of the ear-opening, the skull being considerably longer than the pileus, thus accounting for Bedriaga's statement that the ear-opening is situated further back than in *Lacerta*, "on the side of the neck."

Head $4\frac{1}{2}$ to $5\frac{1}{2}$ times in length to vent; foot not longer than head; parietal foramen usually absent; 34 to 42 scales across middle of body; ventrals in 32 to 37 transverse series; transversely enlarged plates under the fore-arm absent or small . . . . . 2. *N. delalandii*, M.-Edw., p. 13.

Head $4\frac{1}{2}$ to 5 times in length to vent; foot shorter than head; 45 to 53 scales across middle of body; ventrals in 27 to 34 transverse series . . . . . 3. *N. boulengeri*, O. Neum., p. 16.

II. A series of 2 to 7 small scales between the supraoculars and the superciliaries; 40 to 60 scales across middle of body; transversely enlarged plates under the fore-arm.

Head $3\frac{5}{6}$ to $4\frac{1}{2}$ times in length to vent; not or but little broader than deep; foot not or but slightly longer than head; parietal foramen usually present; ventrals in 27 to 34 transverse series; 20 to 26 lamellar scales under the fourth toe . . . . . 4. *N. intertexta*, A. Smith, p. 17.

Head 4 to $4\frac{2}{3}$ times in length to vent, considerably broader than deep; foot considerably longer than head; parietal foramen usually absent; ventrals in 25 to 33 transverse series; 25 to 31 lamellar scales under the fourth toe. 5. *N. tessellata*, A. Smith, p. 24.

1. NUCRAS EMINI.

Nucras delalandii, Tornier, Zool. Jahrb., Syst. xiii, 1900, p. 593.

Nucras emini, Bouleng. Ann. & Mag. N. H. (7) xix, 1907, p. 488; Nieden, Mitt. Zool. Mus. Berl. vii, 1913, p. 76; Bouleng. Ann. S. Afr. Mus. xiii, 1917, p. 199.

Nucras ukerewensis, Bolkay, Archivum Zool. (Budapest), i, 1909, p. 13, figs.

Nucras tessellata, Sternf. in Schubotz, Wiss. Ergebn. Deutsch. Z.-Afr. Exped. iv, 2, p. 222 (1912).

But for the longer tail, proportions much as in *Lacerta agilis*. Head a little broader than deep, $1\frac{2}{3}$ to $1\frac{1}{2}$ times as long as broad, its length 4 to $4\frac{1}{3}$ times in length to vent in males, 5 times in females; snout obtuse; cheeks swollen in the male. Pileus twice as long as broad. Body scarcely depressed. Hind limb reaching the wrist or the axil in males, the limbs barely meeting when adpressed in females; foot as long as the head or a little longer; digits feebly compressed. Tail usually twice as long as head and body.

Nasals in contact behind the rostral; frontonasal broader than long; præfrontals usually forming a median suture, or, rarely, frontal narrowly in contact with the frontonasal; frontal $1\frac{1}{2}$ to $1\frac{2}{3}$ times as

long as broad, as long as its distance from the end of the snout; frontoparietals much shorter than the frontal; parietals $1\frac{2}{3}$ to 2 times as long as broad; interparietal 2 to $3\frac{1}{2}$ times as long as broad; occipital very small.* Four supraoculars,† first and fourth small, first in contact with the frontal; 4 or 5 superciliaries, in contact with the supraoculars. Two superposed postnasals; anterior loreal not half as long as second; subocular not or but little narrower beneath than above, between the fourth and fifth upper labials; two large upper temporals, first much longer than second and in contact with the fourth supraocular, or separated from it by a small shield; lower temporal scales rather large, upper smaller and granular; a large tympanic shield. 4 or 5 large and vertically elongate scales in the middle of the lower eyelid.

Parietal foramen and pterygoid teeth present.

Gular scales much enlarged towards the collar, 18 to 21 between the symphysis of the chin-shields and the median collar-plates; no gular fold. Collar serrated, composed of 7 to 10 plates.

Scales on body granular, round or squarish, smooth, enlarged on the lower part of the side and passing gradually into the ventral plates; 42 to 45 scales across the middle. Ventral plates in 6 or 8 longitudinal and 28 or 29 transverse series in males, 32 in females. Two large præanal plates, one before the other, and a single semicircle of smaller plates.

A series of 7 or 8 transversely enlarged plates on the lower surface of the fore-arm. Scales on upper surface of tibia smaller than dorsals. 10 to 12 femoral pores on each side. 17 to 20 lamellar scales under the fourth toe.

Upper caudal scales rather broad, slightly oblique, strongly keeled, posterior border very obtusely pointed or rounded.

The specimens examined differ in the coloration. The type of *N. emini*, a half-grown male, is pale reddish-brown above, with very small black dots and a faint trace of a light vertebral streak; a black lateral band from the eye to the root of the tail, edged with a light streak above and beneath, and bearing a series of white spots with a tendency to run together into a streak; limbs with small dark brown spots on vermiculations; tail reddish; lower parts white. The other specimens agree better with Bolkay's figure of *N. ukerewensis*. Dark brown above, with a continuous or interrupted white vertebral streak; four series of small white, black-edged spots on each side, the upper and lower corresponding to the light streaks of the pre-

* Absent in the male from Bissel.

† Only 3 in the male from Bissel, the (normally) first being absent.

ceding specimen; hind limb with small white, black-edged ocellar spots; lower parts white.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From end of snout to vent	46	63	60	68	65
,, ,, fore limb	16	23	22	21	20
Length of head	11	15	15	14	13
Width of head	7	10	10	9	9
Depth of head	6	9	9	8	8
Fore limb	15	20	19	19	17
Hind limb	24	26	27	27	25
Foot	14	15	15	14	14
Tail	—	134	—	—	—

1. ♂, L. Victoria (type). 2. ♂, Loika. 3. ♂, Bissel. 4. ♀, Kagiado. 5. ♀, Longido West.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	5.	7.
Hgr. ♂ L. Victoria (type)	46	42	28	8	18	12	18
♂ Loika	63	42	29	10	21	11–10	17
,, Bissel, N.M.	60	44	28	10	20	10–11	19
♀ Kagiado, ,,	68	45	32	9	21	?	20
,, Longido West, ,,	65	43	32	9	20	10	18

1. Length from end of snout to vent. 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Plates in collar. 5. Gular scales in a straight line between symphysis of chin-shields and median collar-plate. 6. Femoral pores (right and left if differing in number). 7. Lamellar scales under fourth toe.

Habitat.—East Africa. The type is from the southern shore of Lake Victoria, where it was found by Emin Pasha. A second specimen, from Loika, from the collection of Mr. W. P. Lowe, is preserved in the British Museum. A third specimen, from Shirati, east shore of Lake Victoria, has been described and figured by Bolkay as *N. ukerewensis*. I have also examined three specimens, recorded above, collected by Mr. A. Loveridge for the Nairobi Museum.

The lizard from Kakoma, ex-German East Africa, shortly noticed by Tornier under the name of *N. delalandii*, is referred by Nieden to this species; it is stated to have 40 scales across the body, 30 transverse series of ventral plates, 14 femoral pores, and the foot a little longer than the head. Specimens from Ukamba and Taita,

also referred by Nieden to this species, have 42 to 51 scales across the body, 26 to 31 transverse series of ventral plates, and 12 to 14 femoral pores. Sternfeld's "*N. tessellata*" is from the Kilimanjaro district.

2. NUCRAS DELALANDII.

Lacerta lalandii, M.-Edw. Ann. Sc. Nat. xvi, 1829, pp. 70, 84, pl. v, fig. 6.

Eremias (*Nucras*) *lalandii*, Gray, Ann. N. H. i, 1838, p. 280.

Lacerta delalandii, vars. *a*, *c*, Dum. & Bibr. Erp. Gén. v, p. 241, pl. xlviii (1839).

Nucras lalandii, Gray, Cat. Liz. p. 33 (1845).

Bettaia delalandii, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 435, pl. —, figs. 1, 5, 35.

Nucras delalandii, Bouleng. Cat. Liz. iii, p. 53 (1887); Werner, Jahrb. Nat. Ver. Magdeb. 1896–98, p. 141; Bouleng. Ann. S. Afr. Mus. v, 1910, p. 475, and xiii, 1917, p. 201, pl. vi, figs. 1–5.

Nucras delalandii, var. *bedriagai*, Werner, l.c.

Head small, not or but slightly broader than deep, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its length $4\frac{1}{2}$ to $5\frac{1}{2}$ times in length to vent in males, 5 to $5\frac{3}{4}$ times in females; snout very obtuse. Pileus $1\frac{3}{4}$ to $2\frac{1}{4}$ times as long as broad. Body much elongate, cylindrical. Limbs short, just meeting (males) or more or less widely separated when adpressed in the adult, overlapping in the young; foot $\frac{3}{4}$ to once length of head; digits short, not or but scarcely compressed. Tail thick, swollen for some distance behind the base in males, $1\frac{2}{3}$ to $2\frac{1}{4}$ times as long as head and body.

Nasals in contact behind the rostral; frontonasal broader than long, as broad as or broader than the internarial space; præfrontals forming a median suture, which may be very short; frontal as long as its distance from the rostral or the end of the snout, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, usually narrower, behind, than the supraoculars; frontoparietals much shorter than the frontal, usually shorter than their distance from the posterior extremity of the pileus; parietals $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as broad, outer border sometimes feebly emarginate for the accommodation of the upper temporal; interparietal narrow, 2 to 4 times as long as broad, sometimes divided into two; occipital very small, sometimes pushed back behind the pileus, or separated from the interparietal by the parietals forming a short median suture. Four supraoculars, first and fourth small, first

usually * in contact with the frontal; 5 to 7 superciliaries, rarely 4 or 8, in contact with the supraoculars, or 1, 2 or 3 granular scales intervening between them. Two superposed postnasals, rarely one †; anterior loreal $\frac{1}{3}$ to $\frac{2}{3}$ length of second; 4 upper labials ‡ anterior to the subocular, which is usually a little narrower beneath than above; an elongate upper temporal, sometimes very broad, sometimes narrow, often divided into two or three, nearly always in contact with the fourth supraocular §; temple covered with small hexagonal or granular scales, which are not or but little larger than the dorsals; a round or oval tympanic shield, rarely absent. 5 or 6 vertically enlarged scales in the middle of the lower eyelid.

Parietal foramen usually absent. Pterygoid teeth present.

Gular scales small, juxtaposed, increasing in size and imbricate towards the collar, 23 to 30 in a straight longitudinal series; no gular fold. Collar feebly serrated, composed of 7 to 14 plates (usually 8 to 10).

Scales on body round or oval, juxtaposed, smooth, 34 to 42 across the middle of the body, 2 or 3 on the side corresponding to a ventral plate. Ventral plates in 8 longitudinal series, those of the second series from the median line the broadest, the outer small, and 32 to 37 transverse series. Præanal region covered with irregular small plates or with a large plate, which may be longer than broad or broader than long, bordered by one or two semicircles of smaller plates; sometimes with two subequal broad plates, one in front of the other.

No transversely enlarged plates on the lower surface of the forearm or a series of a few feebly enlarged plates. Scales on upper surface of tibia smaller than dorsals. 10 to 15 femoral pores on each side. 16 to 22 lamellar scales under the fourth toe.

Caudal scales forming whorls of nearly equal length, upper moderately broad, the median pair broader, strongly keeled, obtusely pointed behind, with distinct sensory pits.

Young pale brown above, with 8 or 10 longitudinal series of white black-edged ocellar spots, with traces of a white vertebral streak on the nape and anterior part of the back (Ann. S. Afr. Mus., Pl. VI, fig. 1); sides of head and sometimes of neck with black and white vertical bars; hind limbs and tail orange or reddish. The ocelli usually persist in the adult (l.c., fig. 2), which are greyish or reddish-brown above,

* In 20 specimens out of 31.

† On both sides in a male from Van Reenen, on the right side in a male from Damaraland.

‡ 5 on both sides in a male from Peri Bush, on the right side in a female from Lessouto.

§ Exceptions in a male from Peri Bush and in another from Barberton.

and the black rings may expand into large spots with a tendency to run together into cross-bars (l.c., fig. 3), in which case the white eyes may become much reduced or disappear, leaving nothing but more or less regular black cross-bars (l.c., figs. 4, 5); head with black spots above, with black spots or vertical bars on the sides, the latter sometimes extending to the throat; these black bars may be accompanied by four very conspicuous white bars between them, the first behind the eye, the fourth behind the tympanum; tail with black spots, or with ocelli as on the body. Lower parts white, uniform, or with more or less numerous round black spots.

Measurements (in millimetres):

	♂			♀		
	1.	2.	3.	4.	5.	6.
From end of snout to vent . .	96	94	81	112	89	88
,, ,, ,, fore limb .	30	27	24	35	26	24
Length of head	19	19	17	20	16	16
Width of head	12	12	11	14	10	11
Depth of head	11	11	11	13	10	11
Fore limb	25	24	21	27	23	22
Hind limb	35	35	31	39	29	29
Foot	18	17	15	19	15	15
Tail	215	195	155	225	145	155

1. Port Elizabeth. 2. Damaraland. 3, 5. Krugersdorp. 4. S. Africa. 6. Peri Bush.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Cape Colony (type), P.M. .	83	38	33	8	30	15–14	17
♀ ,, ,, ,, ,, .	100	35	36	12	31	13	22
♂ Port Elizabeth (Leslie) . .	96	37	36	13	31	14	18
,, ,, (Moorhouse) .	75	41	34	10	27	12–13	19
♀ ,, (Drage) . .	86	36	35	9	25	11–12	19
,, ,, ,, . .	71	40	35	11	29	15	20
,, ,, (FitzSimmons)	100	41	37	12	28	14	22
Hgr. ,, ,, .	69	42	35	10	29	14–13	22
Hgr. ,, ,, .	68	39	33	12	26	13–14	19
♀ Peri Bush, near King Williamstown (Trevelyan)	88	35	35	9	24	12–10	17
♂ ,, (Stenning) . .	102	36	37	10	24	12	18
♀ East London . . .	106	35	37	8	23	12	16
♂ E. Cape Colony . . .	93	39	36	8	26	12–13	20
,, Van Reenen, Natal . .	83	37	34	10	23	12	19
,, Natal	102	34	32	8	26	12 13	18

	1.	2.	3.	4.	5.	6.	7.
♀ Sibudeni, Zululand . .	74	40	35	9	23	10–11	17
„ Lessouto, Basutoland . .	90	35	36	10	25	13–14	17
♂ Krugersdorp, Transvaal .	81	38	35	7	29	14–15	19
♀ „ „ . .	89	35	35	9	30	13	19
♂ Barberton, „ . .	93	37	37	9	29	11	20
♀ Great Namaqualand, P.M. .	90	40	37	12	30	13–12	22
♂ Damaraland	94	37	34	10	28	14	19
„ S. Africa (A. Smith) . .	90	36	36	9	29	15	17
„ „ „ . .	86	38	34	12	29	?	?
„ „ „ . .	60	38	32	9	25	13	17
♀ „ „ . .	120	40	37	9	30	13–14	19
♂ „	89	37	34	9	30	14–13	18
♀ „	112	39	35	14	27	13–11	20

Columns as in the preceding table, p. 12.

Habitat.—Eastern parts of Cape Colony, Natal, Basutoland, Transvaal, Great Namaqualand,* Damaraland.

The specimens in the South African Museum are from the following localities: Knysna, Kentani, Uitenhage, Port Elizabeth, Burghersdorp, East London, Encobo, and West Pondoland, in Cape Colony; Umvoti in Natal; Morija in Basutoland; and Johannesburg in the Transvaal.

3. NUCRAS BOULENGERI.

Nucras boulengeri, O. Neumann, Ann. & Mag. N. H. (7) v, 1900, p. 56; Sternfeld, in Schubotz, Wiss. Ergebn. Deutsch. Z.-Afr. Exped. iv, ii, p. 222 (1912); Nieden, Mitt. Zool. Mus. Berl. vii, 1913, p. 76; Bouleng. Ann. S. Afr. Mus. xiii, 1917, p. 205.

"Body elongate; head not depressed, its length (to ear-opening) contained 4½ to 5 times in the length from snout to vent; two postnasals; no granules between the supraoculars and the supraciliaries; interparietal not so long and narrow as in *N. tessellata* and *N. delalandii*; occipital very small; subocular bordering the lip between the fourth and fifth upper labials; two supratemporals bordering the parietals; tympanum half as large as the ear-opening. Dorsal scales small, pointed behind, larger on the sides of the body; 45 to 53 scales round the body; ventrals in 6 longitudinal and 27 to 30 transverse series. Femoral pores 11 or 12. Foot much shorter than the head. Tail

* Specimens sent to the Paris Museum by F. de Castelnau. The occurrence of this species in the Western parts of South Africa had been questioned by Hewitt, Ann. Transv. Mus., ii, 1910, p. 114.

thinner than in *N. tessellata* and *N. delalandii*, $1\frac{1}{4}$ to $1\frac{1}{3}$ as long as head and body.* Colour brown above, with small indistinct blackish spots; bluish-white beneath."

Distinguished from *N. delalandii* by the smaller size, the smaller and pointed dorsal scales, fewer ventrals, and the shorter foot.

Lubreno, Usoga, East Africa (two specimens).

This species, which is only known to me from the above description, appears to be perfectly distinct.

A third specimen, a male, 63 mm. long from snout to vent, from Lake Victoria, has since been described by Sternfeld. 51 scales round the body, ventrals in 8 longitudinal and 34 transverse series, 12 femoral pores on each side. A fourth, from the Eldama River, East Africa, with 10–11 femoral pores, has been noticed by Nieden.

4. NUCRAS INTERTEXTA.

FORMA TYPICA.

Lacerta intertexta, A. Smith, Mag. N. H. (2), ii, 1838, p. 93.†

Lacerta delalandii, var. *b*, Dum. & Bibr. Erp. Gén. v, p. 243 (1839).

Nucras tessellata, part., Boulenq. Cat. Liz. iii, p. 52 (1887); Hewitt, Ann. Transv. Mus. ii, 1910, p. 112.

Nucras tessellata, var. *ocellata*, Boulenq. Ann. S. Afr. Mus. v, 1910, p. 475.

Nucras delalandii, part., Hewitt, t.c., p. 111.

Nucras intertexta, Boulenq. Ann. S. Afr. Mus. xiii, 1917, p. 205, pl. vi.

Head small, slightly broader than deep, $1\frac{1}{2}$ to $1\frac{3}{5}$ times as long as broad, its length 4 to $4\frac{1}{6}$ times in length to vent; snout obtuse. Pileus $2\frac{1}{5}$ times as long as broad. Body feebly depressed. Limbs moderate, the hind limb reaching the wrist or the elbow; foot as long as the head; digits feebly compressed. Tail tapering from the base, $1\frac{1}{2}$ to $2\frac{1}{5}$ times as long as head and body.

* Tail probably regenerated. In the specimen noticed by Nieden it is nearly twice as long as head and body.

† The type specimen, described by A. Smith and by Duméril and Bibron, was presented to the British Museum by the former author in 1865, under the name of *L. delalandii*, along with the types of the other *Nucras* in his private collection, and its absolute concordance with the original description was overlooked by me when, following Smith himself, I placed *L. intertexta* in the synonymy of *N. delalandii*. Although not labelled as such, the specimen is certainly A. Smith's type. It was referred by me to *N. tessellata*.

Nasals forming a short or very short suture behind the rostral; frontonasal broader than long, broader than the internarial space; prefrontals forming a short or very short suture; frontal as long as its distance from the end of the snout, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, narrower, behind, than the supraoculars; frontoparietals much shorter than the frontal or than their distance from the posterior border of the pileus; parietals $1\frac{2}{3}$ times as long as broad, outer border sometimes emarginate for the accommodation of the anterior upper temporal; interparietal narrow, 3 times as long as the occipital, which may be broader or rudimentary and pushed back behind the pileus; parietals and interparietal shorter in proportion to their width in the very young. Four supraoculars, first and fourth small; first narrowly in contact with the frontal; 5 or 6 superciliaries; 2 to 4 small scales between the supraoculars and the superciliaries. Two superposed postnasals; anterior loreal barely half as long as second; 4 upper labials anterior to the subocular, which is usually narrower beneath than above; an elongate upper temporal, in contact with the fourth supraocular, followed by 2 or 3 smaller shields; temple covered with small hexagonal or granular scales, which are about as large as the dorsals; a round or oval tympanic shield. Lower eyelid with 5 or 6 vertically enlarged scales in the middle.

Parietal foramen and pterygoid teeth present.

Gular scales small, juxtaposed, increasing in size and imbricate towards the collar, 27 to 36 in a straight longitudinal series; no gular fold. Collar even-edged or feebly serrated, composed of 10 to 13 plates.

Scales on body oval, juxtaposed, smooth, 40 to 44 across the middle of the body, 2 and 3 on the side corresponding to a ventral plate. Ventral plates in 6 or 8 longitudinal series, those of the second series from the median line the broadest, and 29 to 34 transverse series. Preanal plate large, with a smaller one on each side and a large pair in front, or two subequal preanals, one in front of the other.

A series of 4 to 7 transversely enlarged plates on the lower surface of the fore limb. Scales on upper surface of tibia smaller than the dorsals. 11 to 14 femoral pores on each side. 20 to 25 lamellar scales under the fourth toe.

Caudal scales forming whorls of nearly equal length, upper rather narrow, the median pair sometimes broader, rather strongly keeled, truncate behind, with distinct sensory pits.

The type specimen, a female from Latakoo, near Kuruman, now rather bleached, has the markings well preserved, although the black has turned to a pale brown, and answers to A. Smith's diagnosis: "Colour

above, reddish-brown, with two rows of circular white spots, discontinued about half way between the anterior and posterior extremities, each spot surrounded by a black ring; sides chequered, black and white, the latter colour disposed in narrow vertical stripes. Tail light brown, with a dotted black line on each side, and the space between them above marked with small black spots. Under parts white." This description is supplemented by a very good account of the same specimen by Duméril and Bibron, of which this is a translation:—

Instead of a great number of small black spots with white pupils (as in *L. delalandii*), there are only two series, spots a little larger, on each side of the back. Two or three irregular blackish spots on the upper lip. Two vertical blackish stripes on the temple, which is white; a third above the ear, and three or four on the neck. Others along the flanks, but shorter; on examining them carefully, one may guess how they were formed. It is probably that, in early youth, white spots mingled with black existed on the flanks; gradually, as they enlarged, the black circle opened above and beneath; then each of the two portions became raised and fused with the other, whilst simultaneously the white central spot enlarged vertically, thus producing alternately black and white vertical bars. Upper surface of hind limbs with some white spots incompletely surrounded with blackish. Here and there some black spots on the upper surface of the base of the tail; others, similar, are present on the sides, so regularly arranged and so crowded as to form a longitudinal stripe (*cf.* Ann. S. Afr. Mus. xiii, pl. vi, fig. 8).

The interpretation given to the markings by the authors of the Erpétologie Générale is fully confirmed by the examination of the young, with which we are now acquainted (var. *ocellata*, Blgr.).

Very young specimens (37–40 millim. to vent) from Pietersburg, Transvaal, are dark brown above and blackish on the sides, with numerous white ocelli in three or four series on the back and three series on each side; a white vertebral streak on the nape, which may be continued, interrupted, on the body; sides of head and neck with black and white vertical lines; upper orbital border whitish; a white streak on each parietal shield, continuous with the outer dorsal series of ocelli; tail coral-red. In a larger young (43 millim.) from Kokong, Bechuanaland, the dorsal markings are the same, but the ocelli on the sides of the body are fused to form vertical bars (l.c., fig. 7).

A half-grown female from Pietersburg is reddish-brown above, with an interrupted light, black-edged vertebral streak, a dorso-lateral series of ocelli, and three series of ocelli on each side, the lower of which

are more or less confluent into a longitudinal streak from the shoulder to the root of the hind limb; head and neck as in the preceding (l.c., fig. 6).

A half-grown male from Rustenburg, Transvaal, is similar to the preceding, but the white eyes of the ocelli on the nape are in the form of longitudinal lines, whilst the black borders of the ocelli run together to form cross-bands on the back, as is frequent in *N. delalandii*, from the young of which it is hardly to be distinguished, so far as the coloration is concerned.

Measurements (in millimetres):

	1.	2.	3.
From end of snout to vent . .	80	63	55
„ „ „ fore limb .	25	21	17
Length of head	17	14	12
Width of head	11	9	8
Depth of head	9	7·5	7
Fore limb	22	20	16
Hind limb	34	29	26
Foot	17	15	13
Tail	117	106	112

1. ♀, type, Latakoo. 2. ♀, Pietersburg, Transvaal. 3. ♂, Rustenburg, Transvaal.

Under the name of var. *holubi*, I group together a number of specimens which, whilst agreeing essentially in structure with *N. intertexta*, differ from the type in the back being striated throughout life.

Var. HOLUBI.

Lacerta tessellata, part., Peters, Reise Mossamb. iii, p. 44 (1882).

Eremias holubi, Steind. Sitzb. Ak. Wien, lxxxvi, i, 1882, p. 83, pl.

Lacerta cameranoi, Bedriaga, Abh. Senck. Ges, xiv, 1886, p. 378, pl., figs. 2, 9, 11, 31.

Nucras tessellata, part., Bouleng. Cat. Liz. iii, p. 52 (1887).

Nucras tessellata, Bouleng. in Distant, Nat. Transv. p. 174 (1892).

Nucras tessellata, var. *tæniolata*, Bocage, Herp. Ang. p. 30 (1895).

Nucras tessellata, var. *ornata*, Bouleng. Ann. Natal Mus. i, 1908, p. 225.

Nucras tessellata, vars. *holubi*, *ornata*, Bouleng. Ann. S. Afr. Mus. v, 1910, p. 474.

Nucras holubi, Sternf. in Schubotz, Wiss. Ergebn. Deutsch. Z.-Afr. Exped. iv, ii, p. 222 (1912).

Nucras intertexta, var. *holubi*, Bouleng. Ann. S. Afr. Mus. xiii, 1917, p. 208, pls. vi and vii.

Head $3\frac{5}{6}$ to $4\frac{1}{2}$ times in length to vent, sometimes as deep as broad, sometimes a little broader, the cheeks often swollen in the males. Pileus usually twice as long as broad. The hind limb reaches the wrist or the elbow, rarely the axil,* or just overlaps the fore limb†; foot as long as or slightly longer or slightly shorter than the head.

Lepidosis as in the typical form, but suture between the prefrontals sometimes longer, frontal sometimes nearly twice as long as broad, interparietal often broader (2 to 3 times as long as broad), first supraocular often extensively in contact with the frontal, and fourth sometimes separated from the anterior upper temporal‡; 2 to 6 small scales between the supraoculars and the superciliaries, of which there may be 7; anterior loreal sometimes more than half as long as second§; tympanic sometimes very small, rarely absent. 26 to 33 gular scales in a longitudinal series; collar composed of 7 to 14 plates. 45 to 60 scales across the middle of the body. Ventral plates in 27 to 34 transverse series. A large preanal bordered by four or six smaller shields, or two large preanals, one in front of the other, or three forming a triangle bordered by a semicircle of small plates. 11 to 20 femoral pores on each side. 20 to 26 lamellar scales under the fourth toe.

Varies much in markings. The principal variations may be arranged as follows, starting with the most primitive:

A. (*N. tessellata*, var. *tæniolata*, Bocage.) 4 or 5‖ white dorsal streaks separated by wider dark brown interspaces, and 3 white streaks on each side, the upper (proceeding from the temple above the ear-opening) broken up, anteriorly, into a series of round spots; on the posterior part of the body these markings fade into a pale buff colour, which also occupies the upper surface of the limbs and tail. The coloration is thus very similar to that of Smith's *L. tæniolata*.—Dongwenna, Mossamedes. (Ann. S. Afr. Mus. xiii, pl. vii, fig. 1).

* Male and young from Bulawayo, female from Port Elizabeth.

† Female from L. Nyassa.

‡ Males from Vredefort Road and Rustenburg, female from Leydenburg. The upper temporal is then entirely on the temple. Bedriaga observes, *à propos* of his *L. cameranoi*, that the upper temporals are on the upper surface, forming part of the pileus, in the South African species (my *Nucras*). The series of specimens here referred to *N. intertexta* shows this character to be by no means a constant one, as these shields may be lateral and perpendicular to the parietals. There is thus in *Nucras* the same amount of variation with respect to this feature as in *L. muralis*, in which Méhely has used it for the distinction of his *Archæolacertæ* and *Neolacertæ*.

§ A single postnasal on one side in a young from Bulawayo.

‖ 4 in the male, 5 in the female; only two specimens examined.

B. 6 whitish streaks on the nape and 5 on the back; sides with 3 longitudinal series of roundish white spots.—Port Elizabeth.

C. (*E. holubi*, Stdr., l.c., lower figure.) 3 white dorsal streaks separated by broader black or dark brown interspaces, and 2 (sometimes broken up into spots) along each side; the white vertebral streak continued for a short distance on the tail, which bears 3 dark longitudinal streaks; the outer dorsal light streak extends on the parietal shield, where it joins the light supraorbital border.—Limpopo Valley, Transvaal (Steindachner); Rustenburg, Transvaal; Vredefort Road, Orange R. Colony; Kimberley, Burghersdorp, Cape Colony. (L.c., fig. 2.)

D. (*E. holubi*, Stdr., l.c., upper figure.) Back reddish brown with three dark-edged light streaks; a broad dark brown or black lateral band, from the temple to above the hind limb, bearing one, two, or three series of roundish white spots, and edged below by a white streak which may be broken up into spots.—Limpopo Valley (Steindachner); Zoutspansberg, Transvaal; Leydenburg, Transvaal; Vredefort Road, Orange R. Colony; Plumtree; Bulawayo; Port Elizabeth. (L.c., fig. 3.)

E. As in the preceding, but temple and side of neck with black and white vertical bars.—Umfolosi R., Natal; Pretoria; Bindura, S. Rhodesia. (L.c., fig. 4.)

F. The black and white vertical bars are continued, more or less distinct, on the flanks.—Umfolosi R. (L.c., fig. 5.)

G. Back reddish brown with black dots and mere traces of the three light streaks; a blackish lateral band with very numerous small round white spots; sides of head with black and white vertical bars; tail with numerous small dark and light spots.—Lake Nyassa. (T.c., pl. vi, fig. 10.) This form appears to represent Bedriaga's *L. cameranoi*, from Tette, Mozambique, but the fingers are not quite so short,* the figure accompanying the description showing them to be very similar to those of *N. delalandii*.

H. As in F, but without the light vertebral streak, and with black dots on the back and on the sides of the belly.—Umfolosi R.

I. As in E, but no light vertebral streak, and the light dorso-lateral streak ending midway between the fore and hind limbs; black dots on the sides of the belly. This variation forms a complete connexion with the typical *N. intertexta*, the only difference being that the light ocellar spots on the nape and anterior part of the back have fused to form a dark-edged lateral streak.—De Kaap Goldfields, Transvaal. (T.c., pl. vi, fig. 9.)

* They are shorter and thicker in the female than in the male.

All the young specimens examined have 3 or 5 light dorsal streaks and the tail is of a coralline red.

The var. *holubi* must be regarded as more primitive than the typical form, and the pattern described under A, along with the *tæniolata* form of *N. tessellata*, as the original from which all others in the genus can be derived without the least difficulty.

Measurements (in millimetres) :

	1.	2.	3.	4.	5.	6.	7.	8.	9.
From end of snout to vent .	80	96	95	75	86	55	62	58	70
„ „ „ „ fore limb	28	29	34	25	30	19	20	21	23
Head	19	20	24	17	20	13	14	13	15
Width of head	12	13	15	11	12	8	9	8	10
Depth of head	11	11	13	10	10	7	7	8	8·5
Fore limb	25	26	29	22	25	17	17	18	20
Hind limb	38	39	45	33	36	26	26	29	33
Foot	19	20	21	17	18	13	13	14	16
Tail	170	—	215	123	180	—	—	116	135

1. ♂, Nyassa. 2. ♀, Nyassa. 3. ♂, Umfolosi R. 4. ♀, Zoutpansberg. 5. ♀, De Kaap Goldfields. 6. ♂, Vredefort Rd. 7. ♀, Vredefort Rd. 8. ♂, Dongwenna. 9. ♀, Dongwenna.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Forma typica.									
♀ Latakoo (type)	80	40	8	32	12	34	11	24	4–3
Hgr. Kokong, Bechuanaland . .	44	42	6	31	13	33	13	24	4–3
♂ Rustenburg, Transvaal . .	55	44	6	29	12	34	13–14	22	3
♀ Pietersburg, „ . . .	63	44	8	34	12	36	14	25	4
Yg. „	40	43	8	30	10	37	13–12	23	3
„ „	38	42	8	31	11	31	12	20	2
var. *holubi.*									
♂ Port Elizabeth	56	50	6	28	9	26	11	21	4–5
♀ „ „	49	48	6	28	11	33	13–12	25	4–3
♂ Burgersdorp, Cape Col. . .	50	49	6	28	11	28	12	24	5
♀ Kimberley, **S.A.M.**. . .	52	44	8	28	11	29	12–13	22	4
♂ Vredefort Road, O.R. Col. . .	55	46	8	29	12	28	12	24	4–5
♂ „ „	52	48	8	28	10	26	12–14	21	5
♀ „ „	62	48	8	30	12	26	14–13	21	4
„ „ „	50	52	8	30	10	27	12	21	4–3
„ „ „	48	55	8	29	8	28	13	20	5
„ Plumtree, **McG. M.** . . .	46	57	8	29	11	33	17	24	6
♂ Umfolosi R., Zululand . . .	95	60	8	31	12	32	17–16	22	2–3
„ „ . . .	65	58	6	31	13	33	15	25	4–5

	1.	2.	3.	4.	5.	6.	7.	8.	9.
var. *holubi.*									
Yg. Umfolosi R., Zululand . .	46	57	6	32	14	33	16	25	5–4
♀ De Kaap Goldfields, Transvaal .	86	55	6	30	12	32	15–16	23	4–3
Yg. Pretoria, „ .	44	48	6	30	10	28	14	26	3–4
♂ Rustenburg, „ .	53	45	8	29	14	31	13	21	5–6
♀ Lydenburg, „ .	66	52	8	31	9	28	17–18	25	5
„ „ „ .	64	49	8	31	11	30	17–16	24	6
„ Zoutpansberg „ .	75	55	8	32	11	32	20–19	24	3
♂ Bulawayo	50	50	8	27	7	28	13–15	22	6–4
Yg. „	42	58	6	29	9	33	15	23	5
♀ Bindura, S. Rhodesia, **S.A.M.** .	49	46	6	28	10	25	15–17	25	4
♂ L. Nyassa	80	44	6	30	10	30	16–15	25	4
♀ „	96	46	6	31	8	31	16–17	25	4–2
♂ Dongwenna, Mossamedes . .	58	45	8	28	10	27	14–13	25	2–3
♀ „ „ . .	70	45	8	34	12	30	14	26	4–5

1. Length from snout to vent. 2. Number of scales across middle of body. 3. Longitudinal series of ventral plates. 4. Transverse series of ventral plates. 5. Plates in collar. 6. Gular scales in a straight line between symphysis of chin-shields and median collar-plate. 7. Femoral pores (right and left if differing). 8. Lamellar scales under fourth toe. 9. Scales between supraoculars and superciliaries.

Habitat.—The range of *N. intertexta* extends from Portuguese East Africa, Nyassaland, and Angola to the northern and eastern parts of Cape Colony.

5. NUCRAS TESSELLATA.

Lacerta tessellata, A. Smith, Mag. N. H. (2) ii, 1838, p. 92; Dum. & Bibr. Erp. Gén. v, p. 244 (1839); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 374.

Lacerta livida, A. Smith, l.c.

Lacerta elegans, A. Smith, l.c.

Lacerta tæniolata, A. Smith, t.c., p. 93; Dum. & Bibr. t.c., p. 247; Bedriaga, t.c., p. 381.

Zootoca tæniolata, Gray, Cat. Liz. p. 29 (1845).

Nucras tessellata, Gray, op. cit., p. 33; Werner, Jen. Denkschr. iv, 1910, p. 329; Bouleng. Ann. S. Afr. Mus. xiii, 1917, p. 212, pl. vii.

Teira ornata, Gray, Proc. Zool. Soc. 1864, p. 58.

Lacerta tessellata, part., Peters, Reise Mossamb. iii, p. 44 (1882).

Lacerta tessellata, subsp. *pseudotessellata*, Bedriaga, t.c., p. 377, pl., figs. 8, 21.

Nucras tessellata, part., Bouleng. Cat. Liz. iii, p. 52 (1887).

Nucras tessellata, var. *elegans*, *livida*, *tæniolata*, Bouleng. Ann. S. Afr. Mus. v, 1910, p. 474.

Head small, considerably broader than deep, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its length 4 to $4\frac{2}{3}$ times in length to vent; snout obtuse. Pileus 2 to $2\frac{1}{4}$ times as long as broad. Body feebly depressed. Hind limb reaching the elbow, the axil, or the shoulder; foot considerably longer than the head; digits slender, feebly compressed. Tail flattened and widened at the base in males, nearly 2 to $2\frac{3}{4}$ times as long as head and body.

Nasals forming a short suture behind the rostral; frontonasal broader than long, broader than the internarial space; prefrontals forming a short suture; frontal as long as or a little longer than its distance from the end of the snout, $1\frac{1}{2}$ to 2 times as long as broad, narrower, behind, than the supraoculars; frontoparietals much shorter than the frontal, or than their distance from the posterior border of the pileus; parietals $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, outer border sometimes emarginate for the accommodation of the anterior upper temporal; interparietal narrow, $2\frac{1}{2}$ to 4 times as long as broad; occipital very short, sometimes broader than the interparietal. Four supraoculars, first and fourth small and sometimes divided into two, first extensively in contact with the frontal; 7 or 8 superciliaries; 2 to 7 small scales between the supraoculars and the superciliaries. Two superposed postnasals, rarely one *; anterior loreal $\frac{1}{2}$ to $\frac{3}{4}$ times as long as second; 4 upper labials anterior to the subocular, which is a little narrower beneath than above; an elongate anterior upper temporal, often in contact with the fourth supraocular, † followed by 1 or 2 smaller shields; temple covered with small hexagonal or granular scales, which are about as large as the dorsals or smaller; tympanic shield roundish, often small or absent.

Parietal foramen usually absent. Pterygoid teeth present.

Gular scales small, juxtaposed, increasing in size and imbricate towards the collar, 25 to 33 in a straight longitudinal series; no gular fold. Collar even-edged, composed of 8 to 13 plates.

Scales on body roundish or oval-hexagonal, smooth, 40 to 60 across the middle of the body, 2 and 3 on the side corresponding to a ventral plate. Ventral plates in 6 or 8 longitudinal series, those of the second series from the median line the broadest, and 25 to 34 transverse series. Preanal region covered with several irregular shields, or with two large shields one in front of the other.

* Types of *L. tæniolata*. Also in a young from Clanwilliam which, in its markings, agrees with the typical *L. tessellata*.

† Not in contact in five specimens: one of the types of *L. tæniolata*, two of the types of *L. livida*, male from Deelfontein and female from Little Namaqualand.

A series of 6 or 7 transversely enlarged plates on the lower surface of the forelimb. Scales on upper surface of tibia smaller than dorsals. 11 to 16 femoral pores on each side. 25 to 31 lamellar scales under the fourth toe.

Caudal scales forming whorls of nearly equal length, upper rather narrow, the median pair often broader, rather strongly keeled, truncate or very obtusely pointed behind, usually with more or less distinct sensory pits.

As in the preceding species, the markings differ very strikingly according to individuals and some at least of the different patterns, on which species have been founded, perhaps indicate local forms or varieties. I here enumerate those with which I am acquainted, beginning with the most primitive.

A. (*L. tæniolata*, Smith.) Eight white streaks on the back and sides, sometimes nine on the nape and anterior part of back, separated by black streaks; the outer dorsal light streak extending to the fourth supraocular, the upper lateral, originating just above the ear, sometimes broken up into spots. Posterior part of back and tail brown above, the latter inclined to red near the extremity and with a blackish lateral streak. Lower parts white.—"Grassy districts of Cape Colony," Smith; Little Namaqualand; Pine Town, Natal (S. African Museum). (Ann. S. Afr. Mus., pl. vii, fig. 6.)

B. (*L. livida*, Smith.) Back with light and dark streaks as in the preceding, or pale buff behind with black vermiculations; sides black with numerous small white spots, which form irregular vertical bars on the temple and neck.—"Northern parts of Cape Colony," Smith; Little Namaqualand; Deelfontein. (L.c., figs. 7, 8.)

C. (*L. tessellata*, Smith; *T. ornata*, Gray.) Neck and anterior part of back black, with 3 or 4 white lines above and very regular white vertical bars on the sides posterior part of body grey or pale buff, with more or less distinct black bars on the sides. Tail coral-red or reddish, at least in the young.—"Eastern parts of Cape Colony," Smith; Clanwilliam, Calvinia, Worcester, Klipfontein, in Cape Colony; Little Namaqualand; Zambesi (Sir J. Kirk). (L.c., figs. 9, 10.) In the var. *pseudotessellata*, described by Bedriaga from Mozambique, there are five white lines on the nape.

D. (*L. elegans*, Smith.) Pale reddish brown above and on the sides; two white, black-edged streaks on the neck.—"Little Namaqualand and the country towards the Orange River," Smith; Smithfield, Orange River Colony.

In the following tabulation of specimens examined, the same arrangement is adopted.

Measurements (in millimetres):

	♂			♀		
	1.	2.	3.	4.	5.	6.
From end of snout to vent	70	65	47	74	80	62
„ „ „ fore limb	24	24	18	25	28	20
Head	15	15	11	16	17	13
Width of head	9	10	7	10	12	8
Depth of head	7	7	5	7·5	9	6
Fore limb	20	22	16	22	22	18
Hind limb	34	37	27	39	40	29
Foot	19	20	15	21	21	16
Tail	—	—	125	—	—	120

1. Type of *L. tessellata*. 2, 4. Little Namaqualand. 3. Klipfontein. 5. Type of *L. livida*. 6. Type of *L. tæniolata*.

Particulars of Specimens Examined.

A.	1.	2.	3.	4.	5.	6.	7.	8.	9.
♀ Type of *L. tæniolata*	62	48	6	32	11	28	15–14	26	6–7
Yg. „ „	40	45	6	27	11	30	15–16	25	5
♀ Little Namaqualand	57	52	8	29	10	29	13	28	4
B.									
♂ Type of *L. livida*	54	46	6	25	8	29	13	27	4–3
„ „ „	47	56	6	29	8	33	12–13	30	2
♀ „ „	80	47	8	30	11	33	11	28	5
♂ Deelfontein, Cape Colony	72	48	8	27	11	31	13	26	4–3
C.									
♂ Type of *L. tessellata*	70	47	6	31	9	31	15–13	27	7–6
„ Klipfontein, Little Namaqualand	47	45	6	30	11	38	15–16	27	6–4
„ Little Namaqualand	65	45	6	29	9	29	15	27	4
♀ „ „	74	42	6	31	12	30	15	27	5–4
♂ Guires, Little Namaqualand	58	44	6	27	12	31	15	28	4
Yg. Clanwilliam, W. Cape Colony	40	41	6	31	9	29	14–15	30	7 6
„ „ „	40	40	6	31	9	32	14	26	5–4
„ Zambesi, type of *T. ornata*	32	46	6	30	13	26	14	26	4
D.									
♀ Type of *L. elegans*	80	45	8	33	8	?	16–14	31	?
„ „ „	62	47	8	32	8	?	14–15	30	4
„ Smithfield, O.R. Col., **S.A.M.**	63	45	6	32	8	33	14	29	3

Columns as in the preceding species.

I have examined in addition 18 specimens preserved in the South African Museum. Scales across the body 40 to 60; femoral pores 12 to 16. One specimen, from Little Namaqualand, with a single post-nasal.

Habitat.—Great Namaqualand and the Zambesi to the Karroo and Natal. Not yet recorded from Southern Rhodesia.

2. LACERTA.

Lacerta, part., Linn. Syst. Nat. i, p. 359 (1766); Dum. & Bibr. Erp. Gén. v, p. 174 (1839); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 24.

Seps, part., Laur. Syn. Rept. p. 58 (1768).

Lacerta, Wagler, Syst. Amph. p. 154 (1830); Wiegm. Herp. Mex. p. 9 (1834); Gray, Cat. Liz. p. 30 (1845); Schreib. Herp. Eur. p. 399 (1875); Lataste, Ann. Mus. Genova (2), ii, 1885, p. 125; Boulenq. Cat. Liz. iii, p. 8 (1887); Werner, Zool. Anz. xxvii, 1904, p. 254; Boulenq. Tr. Zool. Soc. xxi, 1916, p. 1.

Zootoca, Wagler, op. cit. p. 155; Wiegm. l.c.; Gray, Cat. Liz. p. 27.

Podarcis, part., Wagler, l.c.

Podarcis, Wiegm. l.c.

Thimon, Tschudi, Isis, xxix, 1836, p. 551.

Teira, Gray, Ann. N. H. i, 1838, p. 280, and Cat. Liz. p. 33.

Thetia, Gray, Cat. Liz. p. 32.

Nucras, part., Gray, Cat. Liz. p. 33.

Atropis, Glückselig, Lotos, 1851, p. 138.

Gallotia, Boulenq. Tr. Zool. Soc. xxi, 1916, p. 3.

Centromastix, Boulenq. l.c.

Head-shields normal.* Nostril pierced between two to four nasals and bordered by the first upper labial or narrowly separated from that shield. Lower eyelid scaly or with a small transparent disc. Collar well marked. Dorsal scales much smaller than caudals, not or but feebly imbricate; ventral plates not or but feebly imbricate, with truncate or straight posterior border, smooth. Digits cylindrical or compressed, with smooth or tubercular lamellar scales inferiorly. Femoral pores. Tail long, cylindrical.

Europe, Northern and Western Asia, Northern and Tropical Africa.

* A frontonasal, a pair of prefrontals, a frontal, a pair of frontoparietals, a pair of parietals, an interparietal, and (with rare individual exceptions) an occipital; any of these shields may, as an exception, be divided.

This genus is one on which more attention has been bestowed than on any other among the Lacertilia, with astonishing differences of opinion as to the delimitation of the species and their classification.

I have recently (Tr. Zool. Soc. xxi, 1916) explained the principles which have guided me in the systematic arrangement, and my remarks are here reproduced.

It is not often, when having to deal with the phylogeny of existing species, that one can point to any, actually living at the present time, as forming part of the probable ancestral stock; and yet, in this case, I feel pretty confident that *L. agilis* and its close ally *L. parva* have preserved the primitive characters out of which the series represented in Sections I, III and IV of the following classification have been evolved. *L. agilis* is a widely distributed species, now ranging over the greater part of Europe and a considerable part of northern and temperate Asia; it is highly variable both in its lepidosis and in its markings, and, even without imagining a greater amplitude of variation than is known in the existing individuals, we find in it a combination of characters which realise the ideal archaic type leading, through more or less broken chains of forms, still in existence, to the most extreme modifications to be found in the three groups mentioned.

So far as the very scanty palæontological material allows us to judge, the genera *Lacerta* and *Nucras* are the only representatives of the family Lacertidæ known to occur as far back as the Upper Eocene and the Oligocene,* and these two, which are intimately connected and barely separable, must be looked upon as the original ancestral types, out of which the allied genera *Psammodromus*, *Latastia*, *Acanthodactylus*, *Gabrita*, *Ophiops*, *Eremias*, etc., have been derived by a series of modifications which may be formulated as follows:

1. Reduction and disappearance of the teeth on the palate.

2. Flattening and weaker ossification of the skull (reduction of the postfronto-squamosal arch), together with elongation and acumination of the rostrum, accompanied by approximation of the nares to each other (reduction in width of the ascending process of the premaxillary); reduction in some series, increase in others, of the osteo-dermal plates.

3. Disappearance of the foramen parietale.

4. Disintegration of the head-shields: division of the elements surrounding the nostril; intercalation of granules around the supraocular shields; multiplication of the temporal and labial shields;

* Filhol, Ann. Sci. Géol. viii, 1877, p. 269; De Stefano, Atti Soc. Ital. Sc. Nat. xlii, 1904, p. 412; Klebs, Schrift. Phys.-œk. Ges. Königsberg, li. 1910, p. 227.

reduction or division of the lower part of the subocular, ultimately excluding it from the oral border.

5. Formation of a transparent disc in the lower eyelid, and ultimate fusion of the latter with the upper eyelid.

6. Formation of a denticulation or a fringe of scales in front of the ear-opening.

7. Reduction or increase in the size of the scales on the body and tail, decrease in the imbrication of the shields on the belly, reduction and loss of the collar.

8. Lengthening and compression of the digits, accompanied by an increase in the number of inferior lamellæ; multiplication of the scales round the digits; development of keels on the subdigital lamellæ, or of a pectination on one or both sides of the digit.

9. Lengthening of the tail, perhaps accompanied by an increased fragility of the organ.

10. Modification of the patterns of markings, starting from striation, leading on the one hand to ocellation (in longitudinal, irregular, or transverse series), on the other to spotting (longitudinal, irregular), reticulation, and barring. Assumption of vivid colours.

I will now explain how these principles work out when applied to the Lacertidæ, and to the species of *Lacerta* in particular:

1. Teeth are present on the pterygoids in all members of Sections I and II of the genus *Lacerta*, forming a cluster of two or three series in *L. agilis* and *parva*. In Section IV they persist, constantly or with rare exceptions, in *L. taurica, peloponnesiaca, brandtii, lævis,* and *jayakari,* but disappear in the other species, with rare individual exceptions. They are usually absent in the other sections.

2. The subject has been discussed in relation to Prof. v. Méhely's proposal to reverse the series as I conceive it, and I have appealed, in support of my contention, to examples drawn from other groups of Vertebrates; my opinion is also based on considerations derived from a study of Reptilian morphology in series which palæontology conclusively shows to have evolved in a definite direction. In the case of *Lacerta*, the internarial bony space and the postfronto-squamosal arch are broader in *L. agilis* than in any other member of the genus.* The osteodermal plates are most reduced in the forms with strongly flattened skulls; on the other hand, they increase in development in *L. viridis, ocellata,* and *galloti* (in a different line of evolution), in which a flattening of the head and an elongation of the snout obtain as in Section IV, though to a less extent.

* *Cf.* Leydig, Die in Deutschland lebenden Arten der Saurier, pls. i–iii (1872); Degen, P. Z. S. 1910, p. 23, fig. 6.

3. It is not necessary to give reasons for regarding the parietal foramen (in relation to the vestige of the pineal eye) as a primitive character. It is absent in three species only of the genus *Lacerta*—*L. jacksonii, vaucreselli,* and *echinata*; also in a few African species of other genera.*

4. Considerations derived from the study of other families of Lizards lead me to assume that the original condition of the nostril is to be pierced in the centre of a single nasal shield. This condition is not found in any of the Lacertidæ. The next step is for the nasal to divide into two—nasal proper and post-nasal—without the first labial entering the nostril, as we find in some species of *Nucras* and, as an exceptional occurrence, in *Lacerta agilis* and *L. parva.*

As a further stage of evolution in the genus *Lacerta,* I regard the participation of the rostral to the border of the nostril, as in *L. viridis* and *ocellata,* and more or less constantly in some of the members of the *L. muralis* group. A step further still, the nasal portion of the rostral becomes detached as a small shield in front of the nostril, as in some specimens of *L. danfordii,* which in this respect shows the farthest departure from the primitive type in the genus *Lacerta.* In rare cases (*L. agilis, L. vivipara*) it is the lower part of the nasal which has been severed to form a distinct shield between the rostral and the nostril.

In *L. agilis,* as in *L. vivipara,* the superciliaries and the supraoculars are in contact with each other; only in rare cases are a few granules intercalated between them. The absence of granules is retained in many specimens of typical *L. viridis,* in *L. peloponnesiaca,* and, as an exception, in *L. taurica*; in other species a more or less complete series of granules separates the superciliaries from the supraoculars, and in the extreme form *L. oxycephala* the series is often partly double, whilst the first supraocular shows a tendency to break up into small scales. In some species of allied genera, such as *Acanthodactylus* and *Eremias,* the disintegration of the borders of the supraoculars into small scales or granules may be carried further still.

In *L. agilis,* the temple usually bears very large shields, few in number, but there is much variation; in *L. parva* a finer scaling is the rule, and as we proceed in the *L. muralis* series, we reach a stage in which the temple is covered with minute granules, with or without a central (masseteric) shield, which can be traced back to *L. agilis.* The large upper temporal shields and the tympanic shield may also

* *Cf.* Degen, t. c. p. 30. I have previously used the presence or absence of the foramen for distinguishing species in the genus *Draco* (P. Z. S. 1897, p. 198).

become reduced or disappear entirely through breaking up into scales. The upper temporal shields, primarily two in number, are deeper in *L. agilis*, and also in *L. viridis*, than in any other species, and are situated partly on the upper surface of the head (where the anterior forms a suture with the fourth supraocular), partly on the side, thus combining the two extreme positions met with in *L. muralis* and allies, which Méhely explains as due to the shields not being homologous. I regard them as certainly homologous: if lateral in position, they have been reduced in width and pushed aside by the greater lateral extension of the parietals; if dorsal, the lower portion has disappeared through disintegration. Méhely would agree, I should think, that either case must be a reduction from the condition in *L. agilis*.

I conceive five to be the original number of shields on the upper lip to below the eye, the fifth being the subocular. This subocular becomes more and more differentiated from the labials proper by narrowing inferiorly, and may ultimately be excluded from the labial border, as in some *Eremias* and *Acanthodactylus*. In *L. agilis* this shield is very variable in shape and is usually preceded by four upper labials. Five or six anterior upper labials become normal in several forms of the *L. galloti* and *muralis* groups, and the number is often reduced to three in the *L. vivipara* group. As a general rule, the number of labials increases with the length of the snout.

5. The lower eyelid is opaque, usually with more or less enlarged scales in the middle, in all species of *Lacerta* but one (*L. perspicillata*). In *L. parva*, *danfordii* and *dugesii* these large scales have a tendency to become translucid. But in *L. perspicillata* a perfectly transparent disc, formed of a single large scale, occupies the centre of the lid. We know of no connecting-links in the genus *Lacerta* leading to this remarkable feature, but we can realise the process of formation of the disc by examples drawn from the genera *Latastia* and *Eremias*, in which we find a varying number (two or more) of central scales becoming enlarged and transparent, and by their fusion realizing the condition in *L. perspicillata*. In *Cabrita* the transparent disc is very large, occupying nearly the whole of the lower eyelid, and, a step further, in *Ophiops*, the lower eyelid has lost its mobility and fused with the upper, such Lizards having been regarded as deprived of eyelids.

6. A denticulation formed by projecting, more or less pointed scales in front of the ear-opening is known in a single species of *Lacerta*, *L. atlantica*, but I find a slight indication of it in some specimens of *L. muralis*, var. *campestris*, and in *L. jayakari*. The character is further developed and reaches its highest degree in species of *Acanthodactylus*.

7. The rather large, rhombic or hexagonal, keeled dorsal scales of *L. agilis* lead through various gradations to the smooth granules of *L. ocellata* and of many of the members of the *L. muralis* group; a tendency to imbrication, more or less marked in some specimens of *L. viridis*, leads to *L. princeps* and, with an increase in size, to *Algiroides* and *Psammodromus*. The distinctly overlapping character of the large plates on the lower parts in *L. agilis* is lost in the *L. muralis* group, and the number, 6 or 8, of longitudinal rows of these plates, gradually merging into the lateral scales, may be increased, as in *L. ocellata* and *galloti*, or the differentiation may be more abrupt through disintegration of the small outer plates, as in many members of the *L. muralis* group. The large plates forming the so-called collar may be reduced in size and increased in number, at the same time losing the notches between them on their free border, as in *L. muralis* and allies; or they may become adherent to the middle of the breast, as in *Acanthodactylus*; or the whole collar may lose its freedom, and the gular scales pass gradually into the ventral plates, as in *Psammodromus*.

8. Of all the species of *Lacerta*, *L. agilis* has the shortest digits, and they are not at all compressed. In the *L. muralis* group the digits become longer and more compressed, especially distally, as the climbing habits become more and more marked. The series *L. taurica-campestris-serpa* is instructive in this respect. In *L. agilis* the subdigital lamellæ are smooth and undivided, or divided into two. In Lizards adapted for arid sandy tracts the subdigital lamellæ acquire one or several keels (*Latastia*, *Acanthodactylus*, *Eremias*), and a series of pointed scales may form a serration or fringe on one or both sides of the digit (*Acanthodactylus*). These are clearly adaptations to a special mode of life. I cannot conceive the direction of the series reversed, viz., compressed or serrated digits leading to the simple form of *L. agilis*.

9. If ontogeny is a guide to phylogeny, *L. agilis*, which has the shortest tail in the genus *Lacerta*, must be regarded as the most primitive species in this respect, Lizards at birth having invariably a shorter tail in proportion to the body.* Méhely, who considers the longer tail as the more primitive, observes that extremely long, slender, whip-like tails—as in *L. oxycephala*, for instance—are endowed with greater fragility. This may be true—and here again I would look upon extreme fragility of the organ as a specialization, but I must say that

* Measurements of head and body and tail in specimens at birth of four species:—*L. agilis*, 26 + 29 mm.; *L. viridis*, 27 + 27 mm.; *L. vivipara*, 20 + 22 mm.; *L. muralis*, 22 + 28 mm.

in *L. agilis*, which has a short and thick tail, individuals with the organ in a regenerated condition appear to me as frequent as in most other species of the genus, and certainly more than in *L. echinata*, which has the longest and most whip-like tail.

10. According to Eimer,* whose views have been endorsed by Cope† and by Gadow,‡ but which have been opposed by Méhely,§ the primitive type of Lizard is striated, the original light and dark streaks breaking up into spots, and these spots, further becoming confluent into transverse lines, tend to form cross-bands, whilst, in another direction, the markings disappear altogether; in the course of the changes—ontogenetic or phylogenetic, as the case may be—the pattern on the posterior part of the body anticipates the evolution of that on the anterior part.

In most cases the young show a more primitive pattern than the adult, only very exceptionally the reverse (see under *Eremias lugubris*). The more advanced pattern, on the other hand, may appear at birth, and forms in which this is the case are therefore to be regarded as the most remote from the primitive type.

The ancestral type of *Lacerta* I conceive to have had five white streaks, separated by black, on the upper surface, and three, also separated by black, on each side—11 white streaks in all. Of these, the outer dorsal starts from the superciliary border and is prolonged on the tail; the upper lateral starts from the posterior corner of the eye, passes above the tympanum, and ends above the hind limb; the median lateral originates on the upper lip, passes through the tympanum, above the fore limb, ends on the anterior side of the thigh, reappears on the posterior side of the thigh, and is continued on the tail; the lower lateral proceeds from the lower lip, extends on the anterior side of the fore limb, and reappears on each side of the belly, ending on the lower anterior side of the thigh. This arrangement is exemplified by the young *L. agilis*, var. *exigua*, assuming the pale brown colour between the black edges of the white dorsal streaks to have been originally white also,‖ but it is likewise to be traced, though in a less primitive condition, in some young of the typical form of that species. I regard the disposition of the streaks in the young *Acantho-*

* Arch. f. Naturg. 1881, p. 239, pls. xiii-xv.

† Rep. U.S. Nat. Mus. f. 1898, p. 569, pl. v (1900).

‡ Proc. R. Soc. lxxii, 1903, p. 109, pls. iii–v, and Proc. Zool. Soc. 1906, i, p. 277, figs.

§ Ann. Mus. Hung. v, 1907, pp. 80 & 477.

‖ The ideal primary striation, as seen on the nape of some *Nucras* and *Acanthodactylus*, has not actually been observed in *L. agilis*, but I expect it will be found some day, when larger series of young of the var. *exigua* can be examined.

*dactylus** as due to an antero-posterior reduction in their number, by which their position may be shifted; thus the streaks on the nape are the same in number and position as in the archaic young *Lacerta*, but the vertebral terminates a little beyond the shoulders, and the upper lateral streak is present only on the temple; on the body the latter is absent as such, though represented, as in *L. parva*, by a series of spots; in *L. muralis* we also can trace this series of spots, of which the large blue ocellus so often present above the shoulder is one, whilst the lower series is represented by the blue spots on the side of the belly; the median light dorsal streak has vanished in all the members of the *L. muralis* group, except on the nape of certain specimens of *L. peloponnesiaca*.† It is clear that, in this case, the vertebral streak on the base of the tail is not the homologue of that of the nape. That the markings on the nape should be more primitive than those on the body, as in *L. peloponnesiaca*, is fully in accordance with Eimer's law, and it applies also to *L. agilis*. I know of only one exception to this law in the genus *Lacerta*, and it is to be found in the aberrant *L. echinata*. The scheme given by Méhely ‡ for a uniform nomenclature of what he terms "streaks" (light) and "bands" (dark) is correct as regards *L. muralis*, but does not carry us sufficiently far back to be applicable to all the species of *Lacerta*. Further, the topographical terms used are open to objection when we consider the shifting in position which the so-called "superciliary streak" undergoes in *L. agilis*, or the "parietal band" in certain varieties of *L. muralis*§; such terms would lead to misunderstandings if applied throughout the genus.

With the disappearance—the squeezing out, so to speak—of the light vertebral streak, the dark area comprised between the inner dorsal streaks may contract to form a dark vertebral stripe, broad or narrow, and this is to be found in some specimens of *L. agilis*, *L. vivipara*, and *L. muralis*, thus giving rise to another series which leads to the breaking up of the stripe into spots, and their disappearance. The light spots which sometimes appear on the dark bands, as in *L. muralis*, var. *pityusensis*, I regard as secondary. The dark, light-edged vertebral stripe is the initial form of Eimer's scheme, based on *L. muralis*.‖

* Figured in Tr. Zool. Soc. xxi, 1916, p. 13.

† It is a remarkable fact that in all these lizards, when a light vertebral streak or its representative in the form of spots is present, it never extends beyond the base of the tail, although the dorsolateral streaks are continued farther back.

‡ Ann. Mus. Hung. vii, 1909, p. 423, fig. 1.

§ Tr. Zool. Soc. xx, 1913, p. 147, fig. 3.

‖ It is surprising that Eimer should have omitted to take *Acanthodactylus* into consideration, if we bear in mind that he suggested regarding the species

According to the theory here propounded, one may distinguish three grades in the dorsal pattern of striated members of the genus *Lacerta*, beginning with the most primitive: (*a*) a light vertebral stripe, (*b*) a dark vertebral stripe, (*c*) no vertebral stripe or series of spots. Each of these leads independently to the ocellated, spotted, reticulated, cross-barred, or uniformly coloured types.

In the evolution of colours, leaving out of consideration the bright yellow, red, or blue tails which form part of the juvenile livery of some Lizards,* the vivid hues (yellow, green, blue, or red) appear first as a seasonal character of the breeding male, before persisting throughout life; they are afterwards passed on to the female. In all *Lacerta* the young at birth are black and white, grey, or greyish-brown (blackish in *L. vivipara*). In *L. agilis* the typical form retains the grey or brown colour, the males being green on the sides during the spring and early summer only; but very exceptionally the green may extend to the upper surface in males, and may appear on the sides in females; in the vars. *chersonensis* and *exigua*, some specimens of which are further advanced in the direction of *L. viridis*, males are very often, and females less frequently, green all over, and this colour is retained beyond the breeding season. In *L. viridis* both sexes are usually green when adult, and at all seasons; but in some localities the females retain throughout life the brown colour of the young. Blue over the throat and the sides of the head, or as spots or ocelli on the flanks, occurs more frequently in males than in females, and in some forms is the exclusive endowment of the former. Green may be replaced by bright yellow (upper parts of *L. ocellata*, *L. muralis*, var. *nigriventris*, lower parts of *L. viridis*). Red, as an intensification of yellow, passing through orange, adorns the lower parts of many Lizards, especially during the breeding season, or, derived from reddish brown, the back of certain specimens of *L. agilis* (var. *rubra*), appearing in the same order as does the green; or it may accompany the blue as part of the nuptial garb in the males (*L. peloponnesiaca*).

The genus *Lacerta* may be divided into six sections:

of that genus as varieties of *L. muralis* (l.c., pp. 401, 404). As I have already pointed out, the lack of judgment in the appreciation of structural characters detracts much from the value of his otherwise admirable memoir.

* Lacertidæ, Teiidæ, Scincidæ, Agamidæ. As regards the coloration of the rest of the body, I cannot recall a single instance in Lizards in which the young is more brightly coloured than the adult, although in many cases the markings are more sharply defined or the patterns more elegant. This is remarkable, considering that the reverse is the case in many Snakes, Tortoises, and Batrachians.

Section I (*Lacerta*, s. str.), p. 37. *L. agilis*, L., *parva*, Blgr., *viridis*, Laur., *princeps*, Blanf., *ocellata*, Daud.

Section II (*Gallotia*, Blgr.), p. 109. *L. atlantica*, Peters & Doria, *cæsaris*, Lehrs, *galloti*, D. & B., *stehlini*, Schenkel, *simonyi*, Stdr.

Section III (*Zootoca*, Wagl.), p. 126. *L. vivipara*, Jacq., *fraasii*, Lehrs, *derjugini*, Nik., *praticola*, Eversm., *vaereselli*, Torn.

Section IV (*Podarcis*, Wagl.), p. 150. *L. taurica*, Pall., *peloponnesiaca*, Bibr., *muralis*, Laur., *chlorogaster*, Blgr., *jacksonii*, Blgr., *brandtii*, De Fil., *lævis*, Gray, *jayakari*, Blgr., *danfordii*, Gthr., *oxycephala*, D. & B., *mosorensis*, Kolomb., *dugesii*, M.-Edw.

Section V (*Centromastix*, Blgr.), p. 331. *L. echinata*, Cope.

Section VI (*Thetia*, Gray), p. 335. *L. perspicillata*, D. & B.

The first section corresponds exactly to Group I of Bedriaga (1886), and Group IV of Werner (1906); the inter-relationships between its components have been recognised by all recent authors, and are so obvious that no doubt can be entertained as to the species included constituting a natural association. But the group is hardly capable of definition, so closely does it merge into the three following.

The second section, confined to the Canary Islands, I have no doubt was derived from some now extinct form closely related to *L. ocellata*, var. *pater*, inhabiting N.W. Africa, exceptional specimens of which still show traces of light longitudinal streaks; the two postnasals of *L. ocellata* have been reduced to one.

The third section, which I regard as directly derived from *L. agilis*, has been recognized by Bedriaga and by Werner. It should be kept distinct from the *L. muralis* association, although approaching very closely *L. muralis*, vars. *breviceps* and *caucasica*.

The fourth section is so completely linked with the first through *L. agilis*, *parva*, *taurica*, *peloponnesiaca*, and *brandtii*, as to preclude a rigid definition. It constitutes a natural association of forms more or less adapted for climbing.

The last two sections each contain a single perfectly isolated species.

Section I. Lacerta, s. str.—Transverse series of ventral plates with notches between the plates,* longitudinal series 6 to 10 in number; collar strongly serrated; usually two superposed postnasals, or one postnasal and two superposed anterior loreals; femoral pores 10 to 22; subdigital lamellæ 16 to 31 under the fourth toe; pterygoid teeth.

* This character is most marked in *L. agilis*, least in *L. ocellata*, some specimens of which might almost fall under the definition of the following section but for the presence of two superposed postnasals.

Synopsis of the Species.

A. Nostril between 3 or 4 (rarely 2) shields, the rostral not entering its border; subdigital lamellæ 16 to 23; dorsal scales elliptic, rhombic or hexagonal, strongly keeled; 32 to 52 scales across the middle of the body; ventral plates in 6 or 8 longitudinal series; tail never twice the length of head and body.

Granules between the supraoculars and the superciliaries usually absent; usually two large upper temporals; frontonasal rarely broader than internarial space, usually between 6 shields; foot not longer than head . . . 1. *L. agilis*, L., p. 39.

A series of granules between the supraoculars and the superciliaries (rarely reduced to 2 or 3); a single large upper temporal; frontonasal broader than the internarial space, between 8 shields; foot longer than head . 2. *L. parva*, Blgr., p. 60.

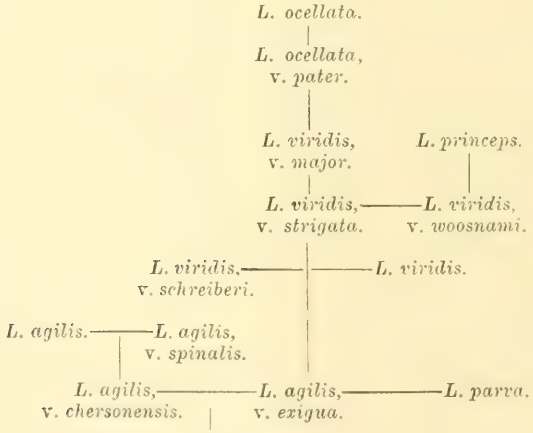
B. Nostril between 5 or 6 (rarely 4) shields, the rostral nearly always entering its border; subdigital lamellæ 21 to 31; usually two large upper temporals, the first in contact with the fourth supraocular; tail $1\frac{3}{5}$ to $2\frac{3}{5}$ times the length of head and body.

Dorsal scales hexagonal or rhombic, rarely oval or roundish, strongly keeled; 38 to 58 scales across middle of body; ventral plates in 6 or 8 longitudinal series . 3. *L. viridis*, Laur., p. 64.

Dorsal scales rhombic and subimbricate, strongly keeled, much larger than the laterals; 34 to 37 scales across middle of body; ventral plates in 10 longitudinal series.

4. *L. princeps*, Blanf., p. 95.

Dorsal scales granular, smooth or feebly keeled; 63 to 100 scales across middle of body; ventral plates in 6 to 10 longitudinal series . . . . . 5. *L. ocellata*, Daud., p. 97.



The above diagram expresses my conception of the relationship between the species and varieties constituting this section.

The series from *L. agilis*, v. *exigua* to *L. ocellata* forms a nearly continuous chain, which there is every reason to regard as representing a straight line of evolution, in which lepidosis, size, and coloration go together, proceeding from east to west in the Mediterranean basin, thus affording a highly suggestive example of derivation of forms living simultaneously at the present period. The missing links in the chain find expression in the separation of the three species.

This suggested line of evolution can, of course, only be postulated by assuming an antiquity for certain existing species which could not be entertained from the standpoint of Mammalian palæontology. We must, however, bear in mind that while in the Upper Eocene and Miocene times the Placental Mammals were in full process of evolution, the lower Vertebrates had practically come to a standstill, so far as important morphological features are concerned, the only great changes that have since taken place being in their distribution, due in many cases to altered climatic conditions.

1. LACERTA AGILIS.

FORMA TYPICA.

Lacerta agilis, part., Linn. Syst. Nat. i, p. 363 (1766); Schreib. Herp. Eur. p. 433 (1875).

Seps argus, Laur. Syn. Rept. pp. 61, 161, pl. i, fig. 5 (1768).

Seps ruber, Laur. op. cit., pp. 62, 162, pl. iii, fig. 3.

Seps cærulescens, Laur. op. cit., pp. 62, 171, pl. i, fig. 3.

Lacerta pardus, Razoum. Hist. Nat. Jorat, i, p. 107, pl. i, fig. 3, and pl. ii, fig. 4 (1789).

Seps stellatus, Schrank, Faun. Boic. i, p. 296 (1798); Koch, in Sturm, Deutschl. Faun. iii, H. 6 (1828).

Lacerta agilis, Wolf, in Sturm, Deutschl. Faun. iii, H. 2 (1799); Lichtenst. Verz. Doubl. Mus. Berl. p. 94 (1823); Brandt & Razeb. Med. Zool. pl. xix, fig. 1 (1829); Bonap. Icon. Faun. Ital., Rett. Anf. (1836); Tschudi, N. Denkschr. Allgem. Schweiz. Nat. Ges. i, 1837, no. 4, p. 21; Bell, Brit. Rep. p. 17, figs. (1839); Gray, Cat. Liz. p. 32 (1845); Leydig, Deutschl. Saur. p. 197 (1872); Bedriaga, Abh. Senckenb. Ges. xiv, 1886, p. 127; Bouleng. Cat. Liz. iii, p. 19 (1887); Méhely, Beitr. Mon. Kronstadt, Herp. p. 10 (1892); Douglass, Herp. Baden, p. 11 (1894); Werner, Rept. Amph. Oesterr.-Ung. p. 28 (1897); Dürigen, Deutschl. Amph. Rept. p. 145, pl. xi, figs. 1–3 (1897); Leighton, Brit. Liz. p. 55 (1903); Schreib. Herp. Eur., ed. 2, p. 473 (1912); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 16, pl. i.

Lacerta stirpium, Daud. Hist. Rept. iii, p. 155, pl. xxxv, fig. 2 (1802); M.-Edw. Ann. Sc. Nat. xvi, 1829, pp. 65, 83, pl. v, fig. 4; Dugès, t.c., p. 377; Jenyns, Man. Brit. Vert. p. 291 (1835); Dum. & Bibr. Erp. Gén. v, p. 196 (1839); Fatio, Vert. Suisse, iii, p. 75 (1872); Martin & Rollinat, Vert. Dép. Indre, p. 282 (1894); Letacq, Bull. Soc. Linn. Normand. ix, 1895, p. 117.

Lacerta laurentii, Daud. t.c., p. 227.

Lacerta arenicola, Daud. t.c., p. 230, pl. xxxviii, fig. 2.

Lacerta anguiformis, Sheppard, Tr. Linn. Soc. vii, 1804, p. 51.

Lacerta agilis grisea, part., Hermann, Obs. Zool. p. 261 (1804).

Lacerta europæa, part., Pallas, Zoogr. Ross.-As. iii, p. 29 (1811).

Lacerta agilis, var. *erythronotus*, Fitzing. N. Classif. Rept. p. 51 (1826).

Lacerta sericea, Glückselig, Lotos, 1851, p. 113.

Lacerta agilis, var. *ischliensis*, Bedriaga, Enst. Farb. Eidechs. p. 18 (1874).

Lacerta agilis, vars. *ocellata*, *atra*, F. Müll. Verh. Nat. Ges. Basel, vi, 1878, pp. 412, 624.

Lacerta viridis, var. *transsylvanica*, Kimakovicz, Verh. Siebenb. Ver. Nat. xxxviii, 1888, p. 107.

Lacerta agilis, vars. *annulata*, *dorsalis*, Werner, op. cit., p. 30.

Lacerta agilis, vars. *immaculata*, *albolineata*, *nigricans*, *melanota*, Dürigen, op. cit., p. 153.

Habit stout,* body not depressed. No very great differences in the proportions between the sexes, these differences sometimes very slight.† Head short and convex, $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad, its depth, in the tympanic region, equal to or a little greater than the distance between the anterior corner of the eye and the anterior border of the tympanum; its length $3\frac{1}{2}$ to 4 times in length to vent in males, 4 to 5 times in females; cheeks more or less swollen, especially in males; snout obtuse, as long as postorbital part of head or as distance from eye to anterior border of tympanum. Pileus $1\frac{2}{3}$ to 2 times as long as broad. Neck as broad as the head, or broader, rarely a little constricted. Limbs short, slightly overlapping when pressed against the body, or hind limb reaching as far as the elbow in males, just meeting or hind limb reaching the wrist in females; foot as long as the head or a little shorter; digits cylindrical, covered

* In spite of its name the least agile species of the genus.

† The difficulty of deciding on the sex of certain adult specimens from external characters is increased by the fact that females occasionally assume the coloration of males.

with two series of scales, one above and one below, or lower series divided into two. Tail cylindrical, often squarish at the base, thick, gradually tapering from the base or thinning out in the second third or half, $1\frac{1}{4}$ to $1\frac{2}{3}$, very rarely $1\frac{3}{4}$ times the length of head and body, but little over one-half of the total length in the very young.

Nostril pierced between two,* three, or four shields. Rostral well separated from the nostril, bent back on the upper surface of the snout, its upper borders sometimes meeting at right angle†; frontonasal nearly always broader than long, sometimes divided into two by a longitudinal cleft, narrower than the internarial space,‡ in contact with the upper part of the anterior loreal, hardly ever with the postnasal §; suture between the nasals very short, rarely half the length of the frontonasal, sometimes absent through the rostral forming a narrow suture with the frontonasal ||; prefrontals usually forming an extensive suture, sometimes with an azygos shield between them; frontal as long as its distance from the rostral or from the end of the snout, $1\frac{1}{4}$ to $1\frac{2}{3}$ times as long as broad, broader behind than the supraoculars, except in the very young; parietals $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad, outer border forming an angular suture with the two upper temporals; occipital usually shorter ($\frac{1}{3}$ to $\frac{2}{3}$) than the interparietal, rarely as long, the two shields equal in width or either the one or the other the broader. Four supraoculars, first very small and in contact with the second loreal,¶ second and third large, second usually longer than third, fourth small and in contact with the first upper temporal **; 4 to 6 (very rarely 3 or 7) superciliaries, first longest, all in contact with the supraoculars,

* Only in two specimens (females from Studland and Lausanne) is the first labial excluded from the nostril, such a condition answering to the definition of the allied genus *Nucras*.

† In the female from Studland just mentioned.

‡ As broad as the internarial space in a male from Düsseldorf.

§ Exception is a female from La Roche-en-Breil, Côte-d'Or, also distinguished by the presence of 4 or 5 granules between the supraoculars and the superciliaries. In a female from Lausanne the shield is entirely enclosed between the nasals and the prefrontals.

|| In males from Arlon, Prague, Vienna, in females from Ringwood, Paris, Lyons, Porté, Lausanne, Mondorf, and in two young from the last locality. In a male from Berlin an azygos shield separates the nasals behind the rostral.

¶ Except in two females from Berlin, in one from Churt, and in a male from La Bourboule. Absent on the left side in a male from Freiburg, Baden.

** Exception is a female from Tilford.

granules being absent or reduced to a few*; suture between the first and second superciliaries as often vertical as oblique. One or two postnasals, followed usually by two superposed anterior loreals; the anterior loreal exceptionally single, smaller than the second, or even entirely absent,† the second usually in contact with the second upper labial; 4 upper labials, rarely 5‡ or 3,§ anterior to the subocular, which is very variable in shape, sometimes nearly as long beneath as above, sometimes much shorter.

Two large and deep upper temporals, usually equal in length, sometimes first or second the longer, each very rarely divided into two; these two shields partly on the upper surface of the head, the first rarely forming a slightly convex suture with the parietal‖; the temple below them covered with smaller shields very variable in size and shape (9 to 28 in number), but generally large, among which a central masseteric and a tympanic are often distinguishable, the tympanic usually in contact with the second upper temporal.

Lower eyelid opaque, with 6 to 10 enlarged, vertically elongate hexagonal scales in the middle, or with two superposed series of such scales.

Pterygoid teeth constantly present, in a small cluster.

14 to 21 (usually 16 to 19) scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold feebly marked or absent, rarely very distinct. Collar with strongly serrated edge, composed of 7 to 12 plates, usually 8 to 10.

Scales on vertebral area (8 to 12 rows) very narrow, elliptic or hexagonal, strongly keeled, juxtaposed, more or less sharply differentiated from the larger dorsolaterals,¶ which are much broader, rhombic or hexagonal, subimbricate, and also strongly keeled; lower down

* 1–2 in a female from Bazias; 2–3 in a male from Fensham Common and in a female from Arlon; 3–4 in a female from Farnham; 3–5 in a young from Mondorf; 4–5 in a female from La Roche-en-Breil.

† Out of 260 cases, I note for the postnasal and anterior loreal: 1, 1 10 times, 1, 2 155 times, 2, 2 58 times, 2, ½ 9 times, 1, ½ 7 times, 2, 3 2 times, 2, 0 19 times. —"½" means that the anterior loreal is partly fused with the postnasal.— 2, 1, occasional in the vars. *chersonensis* and *exigua*, does not occur at all.

‡ Male and female from Southport and from Nagyszeben, male from Farnham, male from Ischl, female from Churt; 5 specimens from Berlin and Vienna.

§ Male from Freiburg, male from Hermannstadt, young from Lausanne.

‖ Male from Lausanne, male from Vienna, male from Nagyszeben, female from Bazias.

¶ There are, however, rare exceptions, as in a male from Lausanne and in a female from Vienna in which the difference is very feebly marked.

on the sides the scales becoming smaller, feebly and diagonally keeled, and then again increasing in size, oval, round, or square, smooth or faintly keeled and passing more or less gradually into the outer ventral plates; 33 to 47 scales (usually 36 to 40) across the middle of the body; 2, or 2 and 3 lateral scales correspond to a ventral plate; 16 (♀) to 30 (♂) transverse series of scales, in the middle of the back, correspond to the length of the head. Ventral plates overlapping, more or less distinctly detached from each other on the posterior border, in 6 or 8 longitudinal and 24 to 31 transverse series (24 to 29 in males, 27 to 31 in females); the plates of the second series from the median line much broader than the others; the outer plates, when 8 series are present, $\frac{1}{4}$ to $\frac{2}{3}$ the size of those of the adjacent series.

Preanal plate large,* bordered by one, rarely by two semicircles of smaller plates or scales, none of which are much enlarged; usually 6 to 8 scales bordering the preanal.

Scales on upper surface of tibia smaller than dorsals, strongly keeled, sometimes rugose with granular asperities.† 16 to 23 (usually 18 to 21) lamellar scales under the fourth toe. 10 to 17 (usually 11 to 14) femoral pores on each side.‡

Caudal scales rather narrow and straight above and beneath, broader and more or less oblique on the sides, dorsals and laterals strongly keeled, without or with rather indistinct apical sensory pits, pointed posteriorly§; the whorls nearly equal in length, the fourth or fifth behind the postanal scales containing 24 to 36 scales.

The coloration and the markings are highly variable, and the latter cannot be well understood without a knowledge of the var. *exigua*, which is evidently in a less advanced condition in this respect.

It has been stated that the young at birth is marked all over with yellowish white, brown- or black-edged ocelli, irregularly distributed or with a mere tendency to form longitudinal series, and that this livery represents the *Seps argus* of Laurenti. A reference to Laurenti's description‖ and figure shows however that the young examined by him had the ocelli disposed in regular longitudinal series. It is quite

* Divided in a female from Odensjö, Sweden, and in another from Southport.

† A male from Vienna is in this respect very similar to *L. mosorensis*.

‡ 8–9 in a male from Poole, according to Bell.

§ In a male from Bournemouth, the point is as obtuse as in some specimens of the typical *L. muralis*.

‖ "Ocelli medio flavi, circulo nigro cincti: dorsales obsoletiores, minus distincti; ad nucham vagis, sed extimæ lineam affectant. Laterales distinctissimæ, in sole aureo-fulgidæ, in tres phalanges, quarum infima utrinque imperfectior, ordinatæ."

true that some individuals show at birth a somewhat irregular disposition of the ocelli, as also happens in the adult; but I am fully convinced that when this is the case these spots will not, later in life, arrange themselves in longitudinal series. I have before me a young, one day old, from Churt, which does not differ from its mother in the character and arrangement of its markings (longitudinal dark bands and ocellar spots). Further, in the young of the so-called var. *rubra* the dorsal region does not bear any ocelli. The "*argus*" livery is not a constant one for the young, as the descriptions of some authors would lead us to believe.

In addition to ocelli, the very young, which are grey or greyish brown above and white beneath, often have a continuous or interrupted yellowish or whitish vertebral streak.*

In a number of young, 30 to 35 millim. long from snout to vent, taken in August at the same spot in Luxemburg, I find the following variations.

In all of them three dark longitudinal bands run along the body and tail; the median, 8 to 10 scales broad, much narrower than the pileus; the lateral, about 6 scales broad, occupies the space between the upper border of the upper temporal shield and the middle of the posterior border of the tympanum. In most of them the dark median band is divided on the nape by a narrow light streak, which in some is continued all along the body whilst in others it is broken up into a series of spots which are dark-edged on the sides, and a similar series of spots extends along the border of the dark band, thus making three series of dorsal ocelli; or the spots bordering the band are more or less confluent into a light dark-edged streak. On each side there is an upper series of large ocellar spots, starting from above the tympanum and terminating above the hind limb; a light dark-edged streak or a series of ocelli from the tympanum to the thigh and reappearing on the tail; a broad light, dark-edged streak along each side of the belly, on the outer ventral plates; sometimes this ventral streak sends off upward processes which break up into spots, thus forming a fourth lateral series of ocelli. A more or less complete light ring surrounds the tympanum, and the lateral streaks or series of spots never extend on the temple as they do in the vars. *exigua* and *chersonensis*. Only exceptionally is a light line present from the superciliary edge along the suture between the parietal and the upper temporal shields, behind which it joins the

* It is highly remarkable that among the very numerous adult specimens I have examined from England and Northern and Central Europe I should never have come across one in which this streak has persisted uninterrupted, as in the var. *spinalis*.

light line bordering the dark vertebral band, which widens towards the occiput.

In other young, from Baden and Basle, we find a tendency for the lateral ocelli to multiply and to lose their regular arrangement, as is frequently the case in adult males.

The three light dorsal streaks or series of spots evidently correspond to the better defined streaks of the young of the var. *exigua*, but the outer, bordering the dark dorsal band, have become disconnected from the superciliary streak. In some cases, however, as has been stated above, the connexion has persisted. That the dark dorsal and lateral bands represent the same in *L. vivipara* and *L. muralis* is beyond question.

This explanation is necessary, as at first sight one might be embarrassed in homologizing the markings with those of, say, *L. muralis*, var. *campestris* or var. *fiumana*, in which a dark vertebral band is bordered on each side by a light streak which appears to correspond to that in the same position in *L. agilis*, but which the above evidence shows to have been lost in most specimens of the typical form of this species; there are, however, exceptions, in which the five original light streaks are represented by as many series of white dots.*

In the adult the dark borders of the ocelli usually expand into large spots (var. *annulata*, Werner), often squarish in shape, and other spots may be added and so crowded as to cover the greater part of the dark dorsal band of the young, which may be edged with black, and the same may take place on the sides; the lighter ground-colour between the bands may then be reduced to a narrow streak along each side of the back. Sometimes the dark markings are confluent into a vertebral stripe, with or without light spots. The whitish eyes of the ocelli or the light dorsal streaks usually persist as central spots or short lines in one, three, or five longitudinal series on the dark vertebral band. The sides bear three or four longitudinal series of black and white ocelli, the upper being the largest and composed of 10 to 15 ocelli from behind the ear to above the hind limb. The ocellar spots are sometimes arranged irregularly or with a tendency to a transverse instead of a longitudinal disposition, but however irregular they may appear, there are never more than five white eyes in a transverse series on the back (the remains of the five original light streaks) and four on each side; this is important to note. In males the lateral ocelli may totally disappear and be replaced by crowded black dots (var. *dorsalis*, Werner). It would be endless to further enumerate the

* In connexion with these remarks I must observe that I regard Werner's diagrammatic figures 58 and 59 in Zool. Jahrb., Syst. vi, 1892, pl. ix, as incorrect.

variations in the arrangement of the spots that may be met with in specimens from the same locality. In males and young the upper surface of the head is usually unspotted or with darker dots or irregularly arranged spots; in many females and in a few males there are large symmetrical dark brown or black markings, which may form a curved band on the inner border of the supraocular region, and a dark upper temporal band may be well defined. The dark longitudinal bands or series of spots are continued on the tail, the striation or longitudinal arrangement being, however, absent when it has disappeared from the body.*

Males, at least in spring and early summer, are yellowish green or grass-green, rarely yellow, on the sides of the head and body, very rarely on the whole body with or without the exception of the median dorsal band, which, according to Norman Douglass, may be brick-red instead of brown. Females are grey or brown above, with the darker markings varying from reddish brown to dark brown or black; in rare cases the sides assume the green colour of the males. The lower parts, including the base of the tail, are green or greenish white in males, nearly always dotted with black or with black vermiculations or markings suggestive of arabic characters,† cream-colour or pale yellow in females, often immaculate, sometimes with black dots all over or restricted to the sides.

A remarkable variation, which affects male as well as female specimens occurring promiscuously with the more normal type in France, Germany, Austria and the Carpathians of Roumania, is that known as var. *rubra* or *erythronotus*. The back is unspotted, reddish brown to brick-red in the adult, the sides being coloured and marked as usual; the young is very similar to *L. viridis*, var. *schreiberi*. In very rare cases there are no spots at all on the body, which retains the three dark dorsal bands (var. *immaculata*, Dürigen). Entirely or nearly entirely black specimens have been described (var. *atra*, F. Müll., vars. *nigricans*, *melanota*, Dürigen).

We thus see the evolution of colour-variations to proceed in several directions. Firstly, the light striation, which is so well defined on the dorsal side of the young of the var. *exigua*, tends to disappear, to be replaced by ocelli, which without losing the serial arrangement of the

* For the reason that the vertebral light streak is never continued beyond the base of the tail (see above, p. 35), the median dorsal dark spots, however well they may be developed, are invariably devoid of the white central eye which may accompany each spot on the body.

† I have come across only one case of a male with scarcely any spots on the lower parts; it was obtained at Southport by Mr. O. Grieg.

white eyes may become irregular or even form cross-bands, as is frequently the case in *L. ocellata*. Secondly, the dark markings may subsist alone to form the three longitudinal bands which are often present in *L. vivipara* and *L. muralis*. Thirdly, the dorsal markings entirely disappear (var. *rubra*), or the lateral band and the ocelli are replaced, as in some males, by a uniform puncticulation, or even the lateral markings are lost (var. *immaculata*). Black specimens appear as the result of an invasion of the ground-colour by the black markings.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.	8.
From end of snout to vent .	85	80	76	68	98	84	83	80
„ „ „ fore limb	30	29	29	26	31	28	30	27
Head	22	19	18	17	19	18	20	18
Width of head . . .	15	14	13	12	13	12	14	12
Depth of head . . .	14	13	13	10·5	13	11	12	11
Fore limb	26	26	25	21	29	23	26	21
Hind limb	36	35	34	30	39	31	38	29
Foot	21	19	18	15	19	17	19	15
Tail	130	128	123	115	127	—	137	—

1. ♂, Lausanne. 2. ♂, Höllsteig, Baden. 3. ♂, Transylvania. 4. ♂, Farnham, Surrey. 5. ♀, Mondorf, Luxemburg. 6. ♀, Odensjö, Sweden. 7. ♀, Vienna. 8. ♀, Studland, Dorset.

Contrary to the rule in many species of this genus, but in agreement with the majority of lower Vertebrates, females are, on an average, larger than males.

A young at birth measures 26 millim. from snout to vent, tail 29.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Sweden:									
♀ Odensjö	84	36	29	9	19	12–13	19	2	2
England:									
♂ Southport, Lancs. . . .	73	39	29	9	18	13–14	19	1	1
„ „ „ . . .	69	37	28	10	18	12–13	19	2–1	2
„ „ „ . . .	67	37	29	8	19	14	20	2	2
„ „ „ . . .	66	38	27	8	18	13 12	20	1	2
„ „ „ . . .	62	42	27	10	18	16–14	?	1–2	2
♀ „ „ . . .	78	35	31	10	19	11–12	19	2	2
„ „ „ . . .	77	40	29	8	18	12–14	19	2	2
„ „ „ . . .	77	39	30	9	18	13	19	2	2
„ „ „ . . .	62	41	29	8	21	14–13	19	2–1	2
„ „ „ . . .	60	41	29	9	20	13 14	21	2	2
„ Studland Heath, Dorset . .	80	40	27	10	18	12–13	18	1	2
♂ Poole Heath, Hants. . .	58	36	25	9	18	12–11	20	1–2	2
♀ „ „ . .	77	37	28	10	18	14–12	18	2	2

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♂ Bournemouth, Hants. . .	64	38	25	10	19	11-12	21	1	2
„ „ „ . .	56	38	29	8	17	13-12	20	1	2
♀ Ringwood, Hants. . . .	68	35	29	9	19	14	21	1	½ 2
♂ Farnham, Surrey . . .	64	36	27	9	18	12	19	1	1
♀ „ „ . . .	72	35	29	9	17	11	21	1	2
♂ Devil's Jumps, Surrey . .	70	37	25	9	17	13-12	20	1	2
„ Fensham Common, Surrey .	68	41	28	9	20	14	22	1	2
„ „ „ .	61	41	27	8	16	12	23	1	2
„ Churt, Surrey	73	37	24	9	18	11	17	1	2
♀ „ „	80	37	29	8	16	13	20	1-2	2 ½
„ Tilford „	80	40	31	10	18	14	20	1	2
France:									
♂ Paris (type of *L. stirpium*), **P.M.**	64	39	29	10	16	13	18	1	2
„ „	80	39	29	9	17	14	22	1	2
♀ „ **P.M.**	80	34	32	10	16	12	18	1	2
„ „	83	34	28	10	17	12-11	18	1-2	2
„ Sénart, near Paris . . .	86	35	31	8	18	12 13	21	2	½
„ La Roche-en-Breil, Côte d'Or .	82	40	30	9	18	12-13	21	2	2
„ Nevers, Nièvre, **L.M.** . .	85	41	29	7	17	15-14	19	1	½
♂ Lyons, **L.M.**	74	41	27	8	16	12	19	2	½
♀ „ „	80	37	29	8	21	13-12	20	1	2 ½
„ „ „	78	40	31	8	17	15	21	2-1	2
♂ La Bourboule, Puy-de-Dôme .	83	37	27	10	14	12-14	20	1	½
♀ „ „ .	94	33	31	8	18	13 14	20	2	½
♂ Puy-de-Dôme	78	36	28	8	16	11-13	17	2	½
„ Beyssac, Corrèze, **L.M.** . .	77	38	28	9	17	14-13	19	1	2
♀ Ax-les-Thermes, Ariège . .	82	34	31	9	18	11	18	1	2
„ Porté, Pyrénées-Orient. . .	62	37	30	9	17	12 13	17	1	2
Belgium and Luxemburg:									
♂ Arlon	60	41	28	10	17	11	21	2	0
♀ „	68	39	29	10	16	14	19	1	2
„ Mondorf	98	38	30	10	18	12-14	20	1	2
„ „	89	39	28	9	15	14-15	18	2	2
„ „	88	40	28	10	15	13	20	2	2
„ „	87	37	27	9	17	12	20	2	2-½
Switzerland:									
♂ Binningen, near Basle . .	85	36	24	9	15	14-13	21	2-1	2
„ „ „ . .	76	39	28	10	19	14-13	22	1	2
„ „ „ . .	73	41	27	7	17	13	21	2	2
„ „ „ . .	68	40	28	10	18	12 11	20	2	2
♀ „ „ . .	83	37	29	9	18	14-16	22	2	½
„ „ „ . .	83	39	29	8	18	13-14	21	1	2
„ „ „ . .	72	40	31	9	15	12	20	1-2	2
„ „ „ . .	67	37	28	7	17	11-12	19	1	2
„ „ „ . .	67	36	28	10	14	12-11	20	1	½-2
♂ Lausanne	85	42	28	8	19	13-14	19	2	0
„ „	85	41	27	11	18	14	21	1	2
„ „	82	37	29	10	16	14-12	19	1	2

	1.	2.	3.	4.	5.	6.	7.	8	9.
♂ Lausanne	70	39	28	9	15	12	19	1	2
♀ „	79	35	31	10	16	12	19	2	0
„ „	76	35	28	11	15	13	16	1	1
Germany:									
♂ Düsseldorf	62	36	26	10	16	11–12	18	1	2
„ „	62	40	25	7	16	12 11	22	1	2
♀ „	74	34	28	10	16	13–12	20	2	2
„ „	63	36	29	8	16	13–12	19	1	2
♂ Freiburg, Baden	80	42	28	11	15	13–12	20	1	2
„ „ „	79	39	28	10	17	12–11	21	2	2
„ „ „	58	38	28	9	18	17	18	1	1–2
„ Höllsteig, „	80	36	27	11	17	14	22	1	1
„ „ „	71	40	25	11	19	14 13	21	1	2
„ „ „	58	40	25	8	15	12 13	21	1	1
„ Berlin	78	40	29	11	19	13	18	1	2
„ „	73	47	29	9	21	16	18	1	2
„ „	72	39	26	11	18	11–12	16	1	2
„ „	72	40	27	10	18	14 13	20	1	2
„ „	65	38	27	9	19	12	18	2–1	2
„ „	51	40	28	8	18	14	16	1	2
♀ „	85	36	30	10	19	15 14	20	2	2
„ „	78	37	30	9	18	12	17	1	2
„ „	75	34	28	9	15	14 12	16	1	2
„ „	73	37	30	10	16	12	17	1	2
„ „	69	40	30	9	18	13	20	2 1	2
„ „	62	39	29	10	18	11–12	17	1	2
„ „ (var. *rubra*)	84	38	30	9	19	12–13	17	1	2
♂ Dresden	79	37	27	10	17	13	20	1	2
„ „	75	37	29	11	16	15–14	20	1	2
„ „	71	33	25	10	14	12 11	20	1	2
„ „ (var. *rubra*)	67	40	25	9	18	14	22	1	2
„ „ („)	67	34	27	9	16	15	19	1	2
♀ „	75	40	29	10	18	12	19	1	2
Bohemia:									
♂ Prague	73	35	24	10	15	13 14	20	1	2
„ „	70	37	28	10	17	11 13	19	1-2	2
„ „	66	40	27	11	18	13	21	1	2
♀ „	85	35	30	8	18	12 14	20	1	2
„ „	80	36	30	11	16	11	19	1	2
„ „	78	37	30	10	17	13–14	18	1	2
„ „	73	34	29	10	16	13 14	20	1	2
Austria:									
♂ Vienna	70	39	26	8	18	17 16	20	1	1-2
„ „	70	37	28	9	17	12 13	19	1	2
„ „	70	37	28	11	16	12	19	1	2
„ „ (var. *rubra*)	70	39	27	12	19	14 12	23	1	2
„ „ („)	63	35	26	9	16	13	20	1	2
„ „	83	40	29	10	16	15–14	20	2	2

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♀ Vienna	74	39	30	10	18	12	19	2–1	2
„ „ (var. *rubra*)	85	39	30	9	15	15–13	21	1	2
♂ Ischl (type of var. *ischliensis*), P.M.	76	34	26	11	17	16	17	1	2
Hungary:									
♀ Budapest	77	37	29	9	16	12	18	1	2
„ „	77	37	30	9	17	12	19	1	2
„ Varpalanka, Comm. Bereg.	84	43	27	9	17	12–11	21	1	1
„ Bazias	75	37	29	9	16	13–14	19	1	2
Roumania:									
♂ Nagyszeben, Transylvania	75	38	26	10	16	10–12	22	1	2
„ „	70	39	26	11	18	12–13	20	1	1–2
♀ „	90	41	29	8	15	12–13	19	1	2
„ „	80	35	29	9	19	13–12	20	1	2
♂ Transylvania	76	35	28	8	14	13	19	2–1	2
♀ Sinaia, Carpathians	63	37	30	9	17	12–11	20	1	2

1. Length (in millimetres) from snout to vent. 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of plates in collar. 5. Number of scales and granules between symphysis of chin-shields and median collar-plate. 6. Number of femoral pores (on right and left sides, if differing). 7. Number of subdigital lamellæ under the fourth toe. 8. Number of postnasals. 9. Number of anterior loreals.

Habitat.—Southern Sweden, Denmark, England, France (absent from the west), Belgium, Holland, Switzerland, Germany, Bohemia, Austria, Hungary, Transylvania, Poland, North-Western Russia, Southern Finland. Highest altitude in the Alps, 1300 m. Generally distributed in the central parts of Europe, it becomes more local to the west. The British localities where its presence has been ascertained are in Surrey, Sussex, Hampshire, Berkshire, Dorsetshire, and Lancashire.

Var. SPINALIS.

Lacerta agilis, var. *spinalis*, Werner, Rept. Amph. Oesterr.-Ung. p. 39 (1897); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 26.

Lacerta agilis, Kolombatovic, Zool. Vij. Dalmat. p. xx (1900); Werner, Wiss. Mitth. Bosn. Herzegov. x, 1907, p. 658.

Lacerta agilis, var. *bosnica*, Schreib. Herp. Eur., ed. 2, pp. 483, 944 (1912).

Schreiber's var. *bosnica* is founded on the presence of a single postnasal and a single anterior loreal ("Das obere Postnasale mit dem Frenale zu einem einzigen hohen Schildchen verschmolzen") in

specimens from Bosnia, a condition apparently unknown to him in the typical form. In his notes on *L. agilis* from Bosnia and Herzegovina, Werner mentions that out of 38 cases examined one postnasal and one anterior loreal occurs 25 times; in 6 cases there are one postnasal and two superposed anterior loreals, in 2 cases two postnasals and two anterior loreals, in 3 two postnasals and no anterior loreal, and in 2 one postnasal and no anterior loreal. One postnasal and one anterior loreal—a combination which is very exceptional in the typical form and never occurs in the var. *exigua*—is therefore the rule in this variety.

The two specimens examined by me are here tabulated:

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♀ Bosnia	77	32	29	9	12	11	17	1	1
„ Babaplanina, Herzegovina .	67	35	30	8	17	12-13	21	1	1

The number of scales is below the average in the typical form, the dorsal scales are not abruptly differentiated from the dorso-laterals, and Werner refers to the large size of the outer ventral plates—a character, however, not shown by the specimens before me—to the low number of gular scales (13 to 16) and of femoral pores (11 to 13). In one of his specimens the occipital is absent and the rostral is in contact with the frontonasal.

Otherwise the proportions and the lepidosis are as in the typical form, and so is the coloration except for the median light spots being confluent to form a vertebral streak (var. *spinalis* of Werner), which, according to Schreiber, is but exceptionally interrupted.

Some specimens are said to have the back uniform red or reddish brown, without any markings, like some of the typical form and of the following variety.

Schreiber regarded the Bosnian lizard as more nearly related to the var. *exigua*, to which it has actually been referred by Boettger (Katal. Rept. Mus. Senckenb. i, p. 82).

Habitat.—Dinaric Alps (up to 2000 m.), Mountains of Bosnia and Herzegovina (up to 1500 m.), and probably Bulgaria.

Var. CHERSONENSIS.

Lacerta chersonensis, Andrzejewski, N. Mém. Soc. Nat. Mosc. (2) ii, 1832, p. 327.

Lacerta viridis, var. n, Schreib. Herp. Eur. p. 434 (1875).

Lacerta agilis, var., Kiritzescu, Bul. Soc. Sc. Bucur. x, 1901. p. 308.

Lacerta agilis, var. *chersonensis*, Bouleng. Tr. Zool. Soc. xxi, 1916, p. 27, pl. ii, figs. 1, 2.

As pointed out by Kiritzescu, the Roumanian specimens from the Carpathian district do not differ in any respect from the typical form, whilst the others, which I refer to the var. *chersonensis*, approach the var. *exigua* and also *L. viridis*.

The head is a little smaller than in the typical form, being contained 4 to 4¼ times in length to vent in males. One postnasal followed by one anterior loreal, as in the var. *spinalis*, is frequent (18 cases out of 38), but there are often two postnasals, followed by one or two anterior loreals; one postnasal and two anterior loreals, forming a triangle, as in the typical form, is the exception (7 cases); postnasal never in contact with the frontonasal.

As in the var. *exigua* the length of the suture between the nasals varies from one-third to two-thirds the length of the frontonasal, which is often as broad as the internarial space. Frontal 1½ to 2 times as long as broad, sometimes not broader than the major supraoculars. Occipital usually shorter than the interparietal. Subocular much narrower beneath than above. Shields covering the temple smaller than the average in the typical form; tympanic usually indistinct.

Scales a little smaller, on an average, than in the typical form, more as in var. *exigua* (17 to 21 along the throat, 38 to 46 across the body), those on the vertebral area much narrower than the dorsolaterals, as in the typical form. Ventrals usually in 6 longitudinal series. Preanal plate large, as in the typical form. Femoral pores more numerous (14 to 18, rarely 13), as in var. *exigua*.

According to Kiritzescu, the tail is sometimes nearly twice as long as head and body.

The markings are very variable. Some specimens have a dark brown vertebral band, measuring ½ to ⅔ the width of the pileus, bearing black spots, in one or two series or irregular, and bordered on each side by a more or less distinct light line; that this light line is the superciliary streak of Méhely is shown by its condition in one male specimen from Zorleni, Roumania, in which, after having followed the outer border of the occiput, it suddenly turns at an angle towards the middle of the nape, as is also the case in certain specimens of the typical form; the dark vertebral band is sometimes divided by a continuous or interrupted light median streak; the sides show two or three lateral series of black and white ocellar spots, of which the upper are the largest, as in the typical form.

Two specimens from Bukarest correspond to Andrzejewski's *L. chersonensis*,* the analogue of the so-called var. *rubra* of the typical form, the back between the upper lateral series of ocelli being uniform reddish brown, a little darker in the middle; vestiges of the superciliary light streak are visible on the nape and pursue their primitive course as a series of whitish dots above the lateral ocelli, thus showing the displacement described above to be in relation with the black vertebral spots. The general colour is grey or brown above in females, green in males, all over or except on the head and vertebral band.† Belly greenish in males, profusely speckled with black; yellowish in females, uniform or scantily speckled with black.

The markings of the young vary as much as those of the adult, and the light vertebral streak is also exceptional. Some young are highly suggestive, at first glance, of striated specimens of *L. muralis*, var. *campestris* and *fiumana*, but what one would take to represent the light "dorsal" streaks of Méhely are in reality the "superciliaries," which extend likewise along the upper surface of the tail.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From end of snout to vent .	80	74	76	76	69
„ „ „ fore limb .	31	28	27	25	22
Length of head	20	18	19	16	15
Width of head	14	12	13	11	10
Depth of head	12	11	12	10	9
Fore limb	25	24	24	23	20
Hind limb	36	33	35	29	27
Foot	19	18	17	16	15
Tail	—	115	130	115	110

1, 2. ♂, Kieff. 3. ♂, Zorleni. 4. ♀, Zorleni. 5. ♀, St. George.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♂ Kieff	80	41	25	10	18	14–15	19	1	1–2
„ „	74	42	24	10	19	14–13	20	1	1

* "Corpus fuscum: supra unicolor immaculatum, ad utrumque latus maculis irregularibus nigris versus abdomen decrescentibus, lineisque albidis interruptis tribus pictum." The name is therefore not a strict synonym of Kessler's var. *orientalis*, as believed by Bedriaga.

† Kiritzescu confirms for this variety Bedriaga's observation on the var. *doniensis* that the green colour of the males is not seasonal, as in the typical form, but is preserved throughout the year. Some male specimens examined by him have lost all traces of the stripes and ocelli, and are uniform green or green speckled with black, both specimens corresponding to the so-called varieties *concolor* and *punctata* of *L. viridis*.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♂ Kieff	71	40	26	10	19	16–15	18	2	2–3
„ Zorleni, Moldavia	76	40	25	9	18	14	20	1	1
„ „ „	73	43	26	10	18	16–14	20	1	1
„ „ „	71	45	26	11	18	14–15	20	2	1
„ „ „	68	40	26	11	19	14	20	1	2
♀ „ „	80	42	29	10	20	14	21	1	2
„ „ „	76	43	28	9	19	14	21	2	2
Yg. „ „	45	46	25	10	20	15–14	21	1	1
„ „ „	41	46	29	10	21	16–14	20	2	1
„ „ „	40	42	28	12	21	18	22	1	1
„ „ „	37	43	29	11	18	14–15	20	1	2–1
„ „ „	33	39	26	12	17	14	19	1	1
„ „ „	33	44	28	11	18	14–15	18	1	1
♂ Bukarest	53	42	25	9	19	14	20	2	1
♀ „	58	41	27	11	19	14	20	1	1
Yg. „	42	40	27	9	20	15	20	1–2	2
„ Lacu-Sarat, Roumania	37	42	27	10	19	15–13	20	2	2–1
♀ St. George, Danube Delta	69	38	30	11	21	16–15	22	2	1

Habitat. — South Russia, along the Dnieper and westwards; Roumania south and east of the Carpathians.

Var. EXIGUA.

Lacerta europæa, part., Pallas, Zoogr. Ross.-As. iii, p. 29 (1811).

Lacerta agilis, Lichtenst. in Eversm. Reise Orenb. Buch. p. 140 (1823); Eversm. N. Mém. Soc. Nat. Mosc. (2) iii, 1834, p. 341; Kulagin, Isvest. Mosc. Univ. lvi, 2, 1888, p. 4, figs.

Lacerta exigua, Eichw. Zool. Spec. iii, p. 188 (1831).

Lacerta sylvicola, Eversm. t.c., p. 344, pl. xxxi, fig. 3.

Lacerta viridis (non Laur.), Rathke, Mém. Sav. Etr. Ac. St. Pétersb. iii, 1837, p. 299.

Lacerta viridis, var. *colchica*, Eichw. Faun. Casp.-Cauc. p. 66 (1841).

Lacerta stirpium, Eichw. op. cit., p. 67.

Zootoca exigua, Eichw. op. cit., p. 71, pl. x, figs. 1–3.

Nucras ? exigua, Gray, Cat. Liz. p. 34 (1845).

Lacerta agilis, var. *dilepis*, Lichtenst. Nomencl. Rept. Mus. Berol. p. 14 (1856).

Lacerta doniensis, Bedriaga, Ensteh. d. Farb. Eidechs. p. 14 (1874).

Lacerta viridis, var. *q*, Schreib. Herp. Eur. p. 442 (1875).

Lacerta agilis, var. *orientalis*, Kessl. Tr. St. Petersb. Nat. Soc. viii, 1878, p. 150.

Lacerta agilis, vars. *chersonensis* et *doniensis*, Bedriaga, Abh. Senck. Ges. xiv, 1886, pp. 146, 151.

Lacerta paradoxa (non Razoum.), Bedriaga, t.c., p. 170, pl. —, fig. 23.

Lacerta agilis, var. *exigua*, Bouleng. Cat. Liz. iii, p. 21 (1887); Nikolsky, Fedtschenko's Reise, Zool. ii, pt. vii, p. 31 (1899); Méhely, in Zichy, Zool. Ergebn. 3. Asiat. Forschungsr. ii, p. 51, pl. vii (1901); Lindholm, Zool. Gart. xliii, 1902, p. 24; Nikolsky, Herp. Ross. p. 104 (1905); Bedriaga, Wiss. Res. Przewalski Reis., Amph. Rept. p. 755 (1912); Schreib. Herp. Eur., ed. 2, p. 480, fig. (1912); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 30, pl. ii, figs. 3–9.

Lacerta agilis, var. *altaica*, Kaschenko, Rezult. Altaisk. Eksp. Str. p. 116 (1899); Cugunov, Ann. Mus. Zool. St. Pétersb. xvi, 1911, p. 231, pl. iv.

Lacerta agilis, vars. *colchica*, *eremioides*, *concolor*, Schreib. op. cit., p. 482.

Lacerta agilis exigua, Nesterov, Ann. Mus. Zool. St. Pétersb. xvii, 1912, p. 76; Nikolsky, Herp. Caucas. p. 49 (1913).

The proportions are the same as in the typical form, but the length of the head in males is contained $3\frac{1}{5}$ to $4\frac{1}{2}$ times in the length to vent and the pileus is 2 to $2\frac{1}{4}$ times as long as broad. Tail sometimes up to $1\frac{4}{5}$ times length of head and body. Nearly always two superposed postnasals, followed by one or, more frequently, two superposed anterior loreals, or anterior loreal absent.* The suture between the nasals usually longer, $\frac{1}{2}$ to $\frac{4}{5}$ the length of the frontonasal, which is usually as broad as or a little broader than the internarial space.† First supraocular sometimes very small, or even almost reduced to a granule and not touching the second loreal.‡ Superciliaries sometimes reduced to two or three.§ Temporal lepidosis very variable,

* Out of 160 cases, 2 postnasals and 2 anterior loreals occur 65 times; 2 postnasals and 1 anterior loreal 39 times; 2 postnasals and no anterior loreal 42 times; 1 postnasal and 2 anterior loreals 14 times; the upper or the lower part of the anterior loreal sometimes fused with one of the postnasals (this is expressed in the table by $\frac{1}{2}$). Specimens with these and other head-shields abnormally multiplied by division have been figured by Cugunov, l.c.

† Narrower in specimens from Moscow, Tomsk, Novorossik, Ala Tau, L. Urkatch, Lepsinskaja Staniza, Altai; in contact with both postnasal and anterior loreal in 5 specimens (Ielenovka, Vladikaukas, Lepsinskaja Staniza, R. Kunges).

‡ In 14 specimens. It is curious to read that Bedriaga (l.c., p. 135) regarded this condition as more characteristic of *L. viridis*.

§ Specimens from R. Kunges. A female from Vladikaukas is exceptional in having a series of 8–10 granules between the superciliaries and the supraoculars. According to Bedriaga, a series of granules may be present in specimens from the Volga district. Otherwise I have never found more than one or two granules.

sometimes consisting of a few large shields, sometimes of small, almost granular scales;* tympanic often indistinct; the two upper temporals, of which the first is nearly always much longer than the second, usually less broad, sometimes but narrowly in contact with the fourth supraocular, or even not touching that shield.† Occipital small or very small, sometimes minute. 5 anterior upper labials is very exceptional; 15 to 23 (usually 17 to 20) gular scales; 8 to 13 (usually 9 to 12) plates in the collar; 34 to 52 scales across the middle of the body, usually 40 to 49. In some specimens the scales on the vertebral region are much narrower and abruptly differentiated from the dorso-laterals, as in the typical form, whilst in others, often from the same locality, the dorso-laterals are only a little broader than the mid-dorsals, and as this peculiarity is usually accompanied by an increase in the number of scales across the body (45 to 52), the scaling of such specimens does not differ in any way from that of a typical *L. viridis*. The ventral plates are usually in 6 rows; if in 8, the outer plates are usually very narrow; in some specimens the differentiation between the ventral plates and the lateral scales is quite abrupt.

Preanal plate usually smaller than in the typical form (its length equal to or less than its distance from the anterior femoral pores), bordered by two semicircles of scales, two of which in front of the plate are often much enlarged and plate-like,‡ or even fused to one plate as large as the preanal, as in the type figured by Eichwald.

Femoral pores rather more numerous, 12 to 18 on each side,§ usually 13 to 16.

30 to 36 caudal scales in the fourth or fifth whorl.

Young brown above, constantly with three light, sometimes black-edged, well-defined light longitudinal streaks; the median begins behind the occipital shield and ends on the base of the tail, the lateral usually from the fourth supraocular to near the end of the tail, or, losing its connexion with the superciliary border, from the outer third of the parietal shield. Three or four whitish lateral streaks or series of whitish black-edged ocellar spots on each side, the two upper originating on the side of the head.

These markings usually persist in the adult, with the addition of a

* Male from Altyn Emel and male from Ielenovka.

† In the types of *L. paradoxa* and in a male from Batum.

‡ "Scuta analia 1–3," Bedriaga, l.c., 1886.

§ Up to 20 according to Rathke; 10 to 16, usually 12 to 15, according to Cugunov, who has tabulated the variations in 89 specimens from the Ilanskaia district on the Trans-Siberian Railway.

series of large squarish or irregular dark brown or black spots between the light dorsal lines, which may be edged with black. In males, which are often green all over, and permanently, including the light dorsal streaks, the spots may be accompanied by numerous black dots. Some specimens lose more or less completely the markings and are uniform green above, or green finely speckled with black as we often see in *L. viridis*. Females are usually grey or brown, but sometimes green like the males.* A female from Minnusinsk, Yenissei, is pale reddish brown, with a yellowish vertebral streak and a bluish grey dorso-lateral band; only scanty vestiges of the ocellar spots on the sides. Schreiber describes a var. *concolor*, uniform olive brown.

Lower parts yellowish or greenish white, or yellow, uniform or dotted with black, the dots usually more profusely distributed in males than in females.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.
From end of snout to vent	92	85	82	80	73	96	90
„ „ „ fore limb	34	30	29	27	27	32	30
Head	23	20	20	18	18	19	19
Width of head	16	15	16	12	12	13	13
Depth of head	14	13	12	10	11	12	11
Fore limb	30	27	25	24	25	26	26
Hind limb	43	37	37	33	34	34	35
Foot	23	20	18	17	18	19	19
Tail	—	140	120	135	130	143	132

1. ♂, Sukhum Kale (type of *L. paradoxa*). 2. ♂, R. Kunges. 3. ♂, Ielenovka, L. Gokcha. 4. ♂, L. Urkatsch. 5. ♂, Saratov. 6. ♀, Tien Shan Mts. 7. ♀, Vladikaukas, Caucasus.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♀ Moscow	78	42	27	9	19	15–16	22	2	0
„ „	70	49	30	9	17	13–14	19	1	2
♂ Charkov	71	49	27	11	19	16	22	2	2
„ Saratov	73	45	27	11	19	14	20	2	½
„ „	73	42	28	11	20	13–14	20	2	2–½
♀ Dongus, near Orenburg	88	42	31	8	21	15–16	21	2	2
♂ Ural	92	46	27	11	18	16	21	1	2
♀ Astrakan	83	46	28	11	22	14–15	20	2	2
„ Vladikaukas	90	46	30	11	23	16	20	2	1
♂ Sukhum Kale (*L. paradoxa*)	92	48	28	11	21	15–14	22	2	0

* According to Bedriaga, wholly green specimens (var. *doniensis*, Bedr.) are so in both sexes in Southern European Russia, whilst in Transcaucasia and in the Kirghiz Steppes the females are brown. A similar colour-dimorphism in females, according to districts, appears to occur also in *L. viridis*.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♂ Sukhum Kale (*L. paradoxa*)	84	48	27	11	21	14	21	2	0
♀ Novorossik	87	47	28	9	22	17–16	21	2	2
♂ Ielenovka, L. Gokcha	85	47	28	11	19	16	20	2	½
,, ,, ,,	82	45	28	11	20	14	20	2	2
,, ,, ,,	80	44	27	11	19	14	19	2	½
,, ,, ,,	70	48	26	12	18	16–14	20	2	½
♀ ,, ,,	90	46	29	12	19	14	18	2	2
♂ L. Gokcha, **P.M.**	82	48	28	12	20	16	19	2	0–½
,, Batum	84	44	27	10	20	18–16	21	2	0
,, Van	77	49	26	11	19	14	19	2	½
,, Kirghiz Steppes	71	46	27	11	16	13	19	2	½–0
,, R. Ilek	66	46	27	9	19	15–16	20	2	2
,, Altyn-Emel	57	52	27	11	19	16	20	1	½
♀ ,,	77	43	31	10	20	13–15	19	2	0
♂ R. Kunges, S. of Kulja	85	44	29	9	17	15–13	18	2	2
♀ ,, ,,	75	42	29	11	18	15	18	2	0–½
,, ,, ,,	73	45	29	12	20	13–15	19	2	2
♂ Lepsinskaja Staniza	90	45	28	10	18	15	20	2	0
,, ,, ,,	89	41	27	9	17	16	18	2–1	0–2
,, ,, ,,	71	40	27	11	18	13–14	20	2	0–2
♀ ,, ,,	87	42	30	10	17	16	19	2	½–0
,, ,, ,,	81	40	29	13	18	13–12	21	2	½
,, ,, ,,	81	42	29	10	19	14–15	18	2	2
,, ,, ,,	63	42	28	10	20	14–16	20	2	2
,, ,, ,,	77	44	28	11	20	14–15	20	2	½
,, ,, ,,	66	34	30	11	18	14–13	17	2	2
♂ Semipolatinsk-Ajagus	87	40	26	9	18	15	18	2	½–2
,, ,,	74	40	27	11	20	15	17	1	2
,, ,,	67	41	29	11	20	15	20	1	2
♀ Arcat Mts.	78	41	30	9	20	13–15	20	2	2
♂ L. Ourkatsch, Tourgaisk	80	45	29	9	20	14	18	2	1
♀ ,, ,,	63	41	30	10	19	14	20	2	0
,, Tomsk	89	48	30	10	22	13–14	18	2	2
,, ,,	75	45	31	11	20	12–14	20	2	2
,, Minnusinsk, Yenissei	71	47	28	10	19	14–15	21	2	1–2
♂ Syr Daria Steppes, Turkestan, **P.M.**	88	43	29	11	17	15	18	2	2
♀ ,, ,, ,,	82	38	30	9	17	14–12	18	2	1
,, ,, ,, ,,	82	40	29	9	18	15	20	2	2
,, ,, ,, ,,	78	41	30	9	17	14–15	20	2	0
♂ Ala Tau	78	39	27	10	19	13–14	19	2	2
,, ,,	76	40	27	11	15	14–15	18	2	2
,, Lepsa, Ala Tau	76	43	28	12	19	15	18	2	½
♀ ,, ,,	72	41	30	11	16	14	18	2	1–½
,, Tian Shan Mts.	96	41	30	11	18	14–15	19	2	2
,, ,,	90	42	31	11	17	13–14	18	2	½
,, ,,	75	41	31	11	19	15–14	19	1	2
,, Kanaika R., Altai	83	47	30	10	19	14	18	2	2
,, ,, ,,	83	40	29	11	19	15–14	18	2	½

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♀ Kanaika R., Altai . . .	62	42	29	10	17	16–15	19	2	2
,, ,, ,, . .	62	40	29	10	18	14–15	18	1	2
,, ,, ,, . . .	60	41	28	9	20	15	18	2	2

Habitat.—South-eastern and Central Russia in Europe east of the Dnieper, Transcaucasia and Armenia, Western Siberia and Central Asia eastwards to the Yenissei and the Altai and Tian Shan Mountains. Ascends the Caucasus to the altitude of 2000 metres.

The forms into which *L. agilis* is divided may be thus defined :—

Forma typica.—Usually 1 or 2 postnasals and 2 anterior loreals ; suture between the nasals very short, rarely half the length of the frontonasal, which is narrower than the internarial space (with rare exceptions) ; 33 to 47 scales across the body, usually 36 to 40 ; preanal plate large, bordered by one, rarely by two semicircles of scales ; 8 to 17 femoral pores on each side, usually 11 to 14 ; light vertebral streak never continuous in the adult.

Var. *spinalis*, Werner. Usually 1 postnasal and 1 anterior loreal ; suture between the nasals very short ; frontonasal narrower than the internarial space ; 32 to 35 scales across the body ; preanal plate large, bordered by one semicircle of scales ; 11 to 13 femoral pores ; a light vertebral streak usually present.

Var. *chersonensis*, Andrz. 1 or 2 postnasals and 1 or 2 anterior loreals ; suture between the nasals $\frac{1}{3}$ to $\frac{2}{3}$ the length of the frontonasal, which is often as broad as the internarial space ; 38 to 46 scales across the body, usually 40 to 43 ; preanal plate large, bordered by one semicircle of scales ; 14 to 18 femoral pores, rarely 13 ; a light vertebral streak usually absent in the adult.

Var. *exigua*, Eichw. Usually 2 postnasals ; anterior loreals 1 or 2 or absent ; suture between the nasals $\frac{1}{2}$ to $\frac{4}{5}$ the length of the frontonasal, which is usually as broad as the internarial space ; 34 to 52 scales across the body, usually 40 to 49 ; preanal plate usually rather small, bordered by two semicircles of scales, one or two of which, in front of the plate, are often much enlarged and plate-like ; 10 to 20 femoral pores, usually 13 to 16 ; a light vertebral streak usually present.

I should like to emphasize the fact that these forms are not sharply definable, and to express the hope that future writers will refrain from availing themselves of the above characters for the purpose of raising the varieties to the rank of species, as has been done by Schreiber in the case of *L. viridis*, basing his definitions chiefly on characters first pointed out by me nearly 35 years ago, but leaving out of

consideration the numerous exceptions which justify the course I have followed.

I am unable to express an opinion on the var. *kurtuana*, Kaschenko, Ann. Mus. Zool. St. Pétersb., xiv, 1909, p. 125, from Central Asia. Size small (85 millim. from snout to vent); tail sometimes nearly twice as long as head and body; masseteric plate much enlarged.

I regard *L. agilis*, and more especially the vars. *chersonensis* and *exigua*, as the ancestral type from which *L. viridis* on the one hand and the species of the *L. muralis* group on the other have been evolved. As regards the latter, the oriental species with two postnasals are connected with it through *L. parva*. The other species, with primarily a single postnasal, are separated by a wider gap, which is only partly filled up by *L. taurica* and *L. peloponnesiaca*. If I am right, South-eastern Europe and the neighbouring part of Asia are to be regarded as the centre of origin of the genus *Lacerta*—a view which is confirmed by the study of the *L. viridis-ocellata* series.

How the markings of the striated form of the *L. muralis* group can be derived from the more primitive pattern of the young *L. agilis*, var. *exigua* is explained further on, when dealing with *L. parva*.

2. LACERTA PARVA.

Lacerta parva, Bouleng. Cat. Liz. iii, p. 22, pl. i, fig. 1 (1887); Werner, Sitzb. Ak. Wien, cxi, i, 1902, p. 1080, pl. i, fig. 4, and pl. ii; Steind. Ann. Hofmus. Wien, xx, 1905, p. 308; Nikolsky, Mitth. Kauk. Mus. iv, 1909, p. 306; Nesterov, Ann. Mus. Zool. St. Pétersb. xvii, 1912, p. 74; Nikolsky, Herp. Caucas. p. 90 (1913); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 36, pl. ii, figs. 10–12.

Head and body feebly depressed. Head small, $1\frac{2}{5}$ to $1\frac{2}{3}$ times as long as broad, $4\frac{1}{6}$ to $4\frac{1}{3}$ times in length to vent in males, $4\frac{4}{5}$ to 5 times in females, its depth equal to the distance between the anterior corner of the eye and the tympanum; snout obtusely pointed, as long as the distance between the eye and the tympanum, with feebly concave loreal region; cheeks not much swollen; length of pileus twice its width. Neck as broad as head, or slightly constricted. Limbs rather short; hind limb reaching the wrist, the elbow, or the axil in males, limbs just meeting or hind limb reaching the wrist or the elbow in females; foot longer than the head; digits feebly compressed. Tail cylindrical, $1\frac{1}{2}$ to $1\frac{4}{5}$ times as long as head and body.

Nostril pierced between the nasal and two postnasals, usually also the first upper labial. Nasals forming a short or very short suture;

frontonasal broader than long, broader than the internarial space, in contact with the upper postnasal and the anterior loreal; frontal as long as its distance from the end of the snout, $1\frac{2}{3}$ to 2 times as long as broad, usually narrower behind than the major supraoculars; parietal $1\frac{1}{4}$ to $1\frac{1}{3}$ times as long as broad, outer border convex, and in contact with the upper postocular; occipital $\frac{1}{2}$ to $\frac{2}{3}$ the length of the interparietal, as broad as or broader than the latter, rarely a little narrower; second supraocular longer than third; 5 or 6, rarely 4, superciliaries, first or second longest, the suture between these two usually oblique, rarely vertical; a series of granules between the major supraoculars and the superciliaries, the series complete or incomplete through the first or first and second superciliaries forming a suture with the supraocular or, rarely, reduced to 2 or 3 granules. Rostral not touching the nostril; first upper labial not always entering the nostril, and if so only at a small point; two superposed postnasals; two loreals, first as long as or shorter than second. 4 upper labials anterior to the subocular,* the lower border of which is much shorter than the upper, sometimes† very short owing to a part of the shield having become detached as an accessory fifth anterior upper labial. Temporal region with moderately large shields or small scales; masseteric shield present, small or large, sometimes divided into two‡; tympanic present, large; a rather large upper temporal, forming a suture with the fourth supraocular, followed by 2 to 4 scales.

Lower eyelid in the middle with one or two series of 6 to 8 enlarged scales, which have a tendency to become semitransparent.

Pterygoid teeth present.

17 to 20 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold distinct; collar strongly serrated, composed of 7 to 10 plates.§

Body covered with moderately large, juxtaposed or subimbricate, hexagonal or rhombic scales, which are strongly and diagonally keeled on the back, larger and losing the keels towards the ventrals; 33 to 43 scales across the middle of the body, 2 transverse series (rarely 3 here and there) corresponding to a ventral plate, 19 to 30 in the middle of the back corresponding to the length of the head. Ventral plates overlapping, more or less distinctly detached from each other

* 3 on one side in a female from Angora.

† In one male from Berchetti Mandam, this reduction of the lower part of the subocular being the nearest approach, in the genus *Lacerta*, to a condition frequent in *Acanthodactylus* and *Eremias*.

‡ Rarely indistinct, according to Werner.

§ Up to 12 according to Werner.

on the posterior border, in 8 (rarely 6) longitudinal and 27 to 33* transverse series (27 to 30 in males, 31 to 33 in females); the plates of the 6 principal rows subequal in size or those of the second series from the median line the broadest; if in 8 rows, outer plates usually narrow, exceptionally half as broad as those of the adjacent series.

Preanal plate moderate or rather small, sometimes divided into three, bordered by two semicircles of small plates.

Scales on upper surface of tibia much smaller than dorsals, strongly keeled. 19 to 23 lamellar scales under the fourth toe. 14 to 20 femoral pores on each side.

Caudal scales obtusely pointed, the upper more or less oblique, diagonally and strongly keeled, the lower also keeled, except quite at the base; the whorls usually not very unequal in length; 24 to 30 scales in the fourth or fifth whorl behind the postanal granules.

Grey or pale brown above, with two darker dorsal bands, each bearing a series of dark brown† spots, which may be large and squarish or small and irregular, or replaced by a series of small ocelli on both sides of the dark dorsal band; bordering these spots on each side a small white spot or streak, the outer of which is the continuation of a streak proceeding from the outer border of the parietal; nape usually with a short dark brown vertebral streak or series of spots; a more or less distinct whitish streak on each side from the upper lip to the thigh; between it and the dorso-lateral series of light spots a dark band with a series of large squarish or round dark brown spots mostly with a white centre, or of white, black-edged ocelli, which in males may be very large and blue; upper surface of head without spots, or with small dark markings following the curved inner border of the supraocular region; tail with a more or less distinct, dark lateral band and with or without a dorsal dark band or series of large dark spots. Lower parts white in the female, pale yellow in the male; in the latter some small blue spots may be present on the sides of the belly. According to Werner, the young differs only in having the light streaks more distinct, more continuous.

The pattern of coloration is derivable from that of the young of *L. agilis*, var. *exigua*, as figured by me (1916), p. 13. The remains of a dark vertebral band, which persist on the nape only, result from the fusion of the dark borders of the light vertebral streak after the absorption of the latter, as in the typical form of *L. agilis*; the paired dorsal spots represent the breaking up of the inner dark border of the dorso-lateral light streak, which retains its normal course instead of being shifted

* Up to 35 according to Werner.

† Sometimes reddish brown in females, *fide* Werner.

towards the vertebral area; the large lateral spots or ocelli on the sides correspond to those in *L. agilis*, and the third or lower lateral streak is absent or represented by the blue spots on the sides of the belly. Thus, although the markings seem to differ very strikingly from those of any of the patterns known in *L. agilis*, they can be easily traced back to the more primitive type represented by the young alluded to above. They agree very well with those of various striated forms of the *L. muralis* group.

When describing *L. parva* thirty-three years ago, from a single female specimen, I regarded the species as nearly allied to *L. agilis* and *L. viridis*. In this view I am confirmed by further study of a better material, but at the same time I consider *L. parva* as a link between *L. agilis* and *L. brandtii*, so perfect that it is difficult to decide whether it is more closely related to the one than to the other.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.
From end of snout to vent	55	52	50	46	53	53	49
„ „ fore limb	20	18	17	17	19	17	16
Head	13	12	12	11	11	11	10
Width of head	9	9	8	8	7·5	7	7
Depth of head	7	6·5	6·5	6	6·5	6	5
Fore limb	18	17	17	15	17	16	15
Hind limb	26	27	26	23	25	24	21
Foot	13	12	14	13	14	13	11
Tail	94	—	90	77	83	—	74

1. ♂, Angora. 2, 3. ♂, Sari Keny. 4. ♂, Berchetti Mandam. 5. ♀, (type), Kaisarieh. 6. ♀, Angora. 7. ♀, Sari Keny.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♀ Kaisarieh (type)	53	38	31	8	20	17	22
♂ Sari Keny	52	43	28	8	20	18–17	21
„ „	50	40	27	10	18	15	21
♀ „	49	36	33	10	18	16–17	19
♂ Berchetti Mandam	50	38	27	8	20	16–17	21
„ „ „	50	42	30	8	19	19	23
„ „ „	46	41	27	9	19	19–20	23
„ Angora	55	38	30	9	18	17	21
„ „	52	40	29	9	18	15–17	22
„ „	52	43	30	8	17	16	21
„ „	51	36	28	7	17	15–17	20

		1.	2.	3.	4.	5.	6.	7.
♂	Angora	50	37	27	7	17	16–15	20
,,	,,	50	38	27	8	17	17	20
♀	,,	53	33	31	8	17	14	20
,,	,,	53	34	32	9	17	15–14	21
,,	,,	48	40	31	10	20	15–14	21
,,	,,	47	38	31	9	17	16	20

Table as in *L. agilis*, p. 50, but without columns 8 and 9, the number of postnasals and anterior loreals being constantly 2, 1.

Habitat.—Steppes of Eastern Asia Minor, from Eski-Shihir to Kaisarieh, up to 1800 m. in the Erdshias Dagh, according to Steindachner. I am indebted to M. H. Gadeau de Kerville for the privilege of examining a good series of specimens obtained by him in the district of Angora, where this lizard occurs together with the far commoner *Ophiops elegans*, some individuals of which are strikingly similar to *Lacerta parva* in their proportions, coloration, and general appearance. The species is also reported from Transcaucasia (district of L. Gokcha), but the identification of the specimens perhaps requires confirmation.

3. LACERTA VIRIDIS.

FORMA TYPICA.

Seps sericeus, Laur. Syn. Rept. pp. 61, 160, pl. ii, fig. 5 (1768).

Seps terrestris, Laur. t.c., pp. 61, 166, pl. iii, fig. 1.

Seps varius, Laur. t.c., pp. 61, 1721, pl. iii, fig. 2.

Seps viridis, Laur. t.c., pp. 62, 175.

Lacerta viridis, Daud. Hist. Rept. iii, p. 144, pl. xxxiv (1802); Wolf, in Sturm's Deutschl. Faun. iii, pt. 4 (1805); Lichtenst. Verz. Doubl. Mus. Berl. p. 92 (1823); Dugès, Ann. Sc. Nat. xvi, 1829, p. 373; Gachet, Act. Soc. Linn. Bord. vi, 1833, p. 168; Eversm. Nouv. Mém. Soc. Nat. Mosc. iii, 1834, p. 339; Bonap. Icon. Faun. Ital., Amf. (1836); Tschudi, N. Denkschr. Allg. Schw. Nat. Ges. i, 1837, No. 4, p. 18; Dum. & Bibr. Erp. Gén. v. p. 210 (1839); Schulz, Faun. March. p. 447 (1845); De Betta, Mem. Acc. Verona, xxxv, 1857, p. 129; Fatio, Vert. Suisse, iii, p. 69 (1872); Leydig, Deutschl. Saur. p. 182 (1872); De Betta, Fauna d'Ital., Rett. Anf. p. 25 (1875); Schreib. Herp. Eur. p. 441 (1875); Lataste, Herp. Gir. p. 83 (1876); Collin de Plancy, Bull. Soc. Zool. France, 1877, p. 325, pl. vi; F. Müll. Verh. Nat. Ges. Basel, vi, 1878, p. 413; Boettg. Ber. Senck. Ges. 1881–82, p. 256; Camerano, Mon. Saur. Ital. p. 72, pl. ii (1885), and

Boll. Mus. Torin. i, 1886, no. 11; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 62; Bouleng. Cat. Liz. iii, p. 14 (1887); Minà-Palumbo, Nat. Sicil. ix, 1890, p. 298; Méhely, Beitr. Mon. Kronstadt, Herp. p. 5 (1892); Douglass, Herp. Baden, p. 6 (1894); Martin & Rollinat, Vert. Dép. Indre, p. 279 (1894); Werner, Rept. Amph. Oesterr.-Ung. p. 31 (1897); Dürigen, Deutschl. Amph. Rept. p. 114, pl. x, figs. 2–4 (1897); Gadeau de Kerville, Faune Normand. iv, p. 159 (1897); Werner, Wiss. Mitth. Bosn. Herzeg. vi, 1899, p. 819; Rollinat, Mém. Soc. Zool. France, xiii, 1900, p. 5; Kolombatov. Zool. Vij. Dalm. p. xxi (1900); Kiritzescu, Bul. Soc. Sc. Bucur. x, 1901, p. 305; Nikolsky, Herp. Ross. p. 94 (1905); Werner, Wiss. Mitth. Bosn. Herzeg. x, 1907, pp. 659, 666; Lehrs, Zool. Jahrb. xxviii, 1909, p. 82, figs.; Kowatcheff, Herp. Faun. Bulg. p. 22 (1912); Schreib. Herp. Eur., ed. 2, p. 490 (1912); Maluquer, Bol. Soc. Espan. H. N. xviii, 1918, p. 403; Bouleng. Bol. Soc. Espan. H. N. xix, 1919, p. 59.

Lacerta bilineata, Daud. t.c., p. 152, pl. xxxv, fig. 1.

Lacerta sericea, Daud. t.c., p. 224.

Lacerta fusca, Daud. t.c., p. 237.

Lacerta chloronota, Rafin. Caratt. alc. n. Gen. Anim. p. 7 (1810).

? *Lacerta sicula*, Rafin. op. cit., p. 8.

Lacerta europæa, part., Pall. Zoogr. Ross.-As. iii, p. 29 (1811).

Lacerta smaragdina, Meisner, Mus. Nat. Helv. i, p. 4, pl. vi (1820); Schinz, Naturg. Rept. p. 99, pl. xxxvii (1833).

Lacerta varius, M.-Edw. Ann. Sc. Nat. xvi, 1829, pp. 44, 83.

Lacerta elegans, Andrzej. Nouv. Mém. Soc. Nat. Mosc. ii, 1832, p. 328.

Lacerta bistriata, Schinz, op. cit., p. 100, pl. xxxvii.

Lacerta viridis, var. *mento-cærulea*, Bonap. l.c.

Lacerta cyanolæma, Glückselig, Lotos, 1851, p. 111.

Lacerta viridis, vars. *concolor*, *versicolor*, *maculata*, *cinereo-nigrescens*, *brunneo-viridescens*, De Betta, Mem. Acc. Verona, t.c., p. 133.

Lacerta viridis, vars. *punctata*, *nigra*, *variolata*, *radiata*, *quadriradiata*, Schreib. Herp. Eur. p. 442.

Lacerta viridis, var. *vaillanti*, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 100; Werner, Sitzb. Ak. Wien, cx, i, 1902, p. 1068; Schreib. Herp. Eur., ed. 2, p. 495.

Lacerta viridis, vars. *flavescens*, *similis*, *istriensis*, *holomelas*, Werner, Rept. Amph. Oesterr.-Ung. p. 32.

Lacerta viridis, var. *intermedia*, Méhely, Ann. Mus. Hung. v, 1905, p. 304, fig.

Habit more slender than in *Lacerta agilis*. Head usually some-

what more elongate and always less convex, $1\frac{2}{5}$ to $1\frac{3}{5}$ times as long as broad,* its depth equal to the distance between the anterior corner of the eye and the tympanum, its length $3\frac{2}{3}$ to $4\frac{1}{2}$ times in length to vent in males, $4\frac{1}{2}$ to 5 times in females; snout less obtuse, as long as the postorbital part of the head or slightly less; cheeks more or less swollen in the males; pileus 2 to $2\frac{1}{3}$ times as long as broad, in adult males often very uneven or rough.† Neck usually a little constricted. The hind limb reaches between the wrist of the adpressed fore limb and the collar in males, the wrist or the elbow, rarely the axil, in females; the limb shorter, on an average, in specimens from Central and South-eastern Europe than in those from Italy. Foot 1 to $1\frac{2}{5}$ times the length of the head, rarely slightly less, in males, $1\frac{1}{8}$ to $1\frac{2}{5}$ times in females; digits feebly compressed. Tail cylindrical, gradually tapering, $1\frac{3}{4}$ to $2\frac{2}{3}$ times the length of head and body, usually about twice, $1\frac{2}{3}$ to $2\frac{1}{5}$ times in the oriental specimens mentioned further on; shorter in the very young.

Nostril pierced between 5 or 6, rarely 4, shields. Rostral touching or entering the nostril,‡ not so deep as in *L. agilis*; suture between the nasals short or very short,§ rarely half the length of the frontonasal, which is nearly always broader than the internarial space,‖ and usually broader than long; the sides of the frontonasal nearly always in contact with the upper postnasal and with the anterior loreal, or, if the latter be absent, with the second loreal, sometimes¶ with the three shields; prefrontals usually forming an extensive suture, an azygos shield rarely present between them**; frontal as long as its distance from the nasals or the end of the snout, $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as broad, broader than the supraoculars, except in the young, often concave in old specimens, its outline usually rounded in front, in males sometimes trilobate; often a groove (suture between the frontal bones) along the middle of the shield, giving it the appearance of being divided into two; parietals $1\frac{1}{3}$ to $1\frac{3}{4}$ times as long

* Fatio is evidently mistaken in stating "la plus grande largeur égalant, en général, la moitié de la longueur."

† Often much more than in males of similar size of the var. *major*.

‡ Exceptions in a male from Jersey, in a female from Korito, and in a female from Salonica.

§ The rostral is in contact with the frontonasal in a female from Turin. An azygos shield separates the nasals in two females from St. Epain.

‖ Exceptions in a female from Prague and in one from Znaim.

¶ In several specimens from France and the Channel Islands.

** In a male from Cattaro and in a female from Znaim. In a female from Valdeblore and in another from Korito, the frontonasal is in contact with the frontal.

as broad, shorter in the young, outer border convex or forming an angular suture with the two upper temporals; occipital usually shorter and narrower than the interparietal, but sometimes as broad and very rarely broader,* not infrequently separated from it by the parietals meeting on the median line, often reduced to a granule, rarely absent†; a small shield may be intercalated between the interparietal and the occipital.‡ Normally four supraoculars, first small or very small, often reduced to a granule, or not reaching the second loreal,§ second and third large, second the longer, fourth moderately small and constantly forming a suture with the first upper temporal; 4 to 7, usually 5 or 6, superciliaries, first usually longest, all in contact with the supraoculars,‖ or with granules between them, these varying in number from 1 to 11 and never forming a complete series; suture between the first and second superciliaries as often vertical as oblique. Usually two regularly superposed postnasals, a short and deep anterior loreal, and a large second loreal; sometimes three postnasals¶; anterior loreal rarely divided, or absent**; very rarely two postnasals may form a triangle with a small anterior loreal,†† as frequently occurs in *L. agilis*. Nearly constantly 4 upper labials‡‡ anterior to the subocular, which is much narrower beneath than above. Two large upper temporals (rarely fused to one) in contact with the parietal, the two equal or the

* The largest occipitals I have seen are in a male from Prague, with the shield shorter but considerably broader than the interparietal, and in a male from Bazias, in which it is a little longer and a little broader than the latter.

† In specimens from Jersey, Montpellier, and Turin.

‡ In a male from Jersey and in females from Fontainebleau, Valdeblore, Sicily, and Biganos. Leydig says of German specimens, "Das Interparietale fand ich öfters durch eine Querfurche getheilt."

§ Absent in 10 specimens (Jersey, St. Malo, Oléron, Cadillac, Valdeblore, Spezia, Turin, Modica, Prague). In single females from St. Epain, Oléron and Valdeblore, the first supraocular is replaced by 3–4 small shields, the inner of which is in contact with the frontal.

‖ Numerous specimens from France, the Channel Islands, and Italy.

¶ Such exceptions, to which Lataste has drawn attention in dealing with the lizards of the Gironde, appear chiefly in specimens from the extreme west of the range of the species.

** In western specimens the second loreal, if distinct from the first, forms a suture with the second labial, whilst in most eastern specimens the first loreal is larger and the second is pushed further back.

†† On one side in a male and a female from St. Epain, in a female from Oléron, in a male from Montpellier and in another from Turin, on both sides in a female from Sicily (Paris Museum).

‡‡ 3 on both sides in females from Jersey, St. Epain, Oléron, and Prague, on one side in females from Jersey, Valdeblore, and Turin; 5 on one side in a young from Ostia and in a male from Hernani, which is further remarkable in having 4 instead of 3 pairs of chin-shields in contact with each other.

first (rarely the second) the longer, the first in contact with the fourth supraocular; temple covered with very variable shields,* which are usually large and irregular and often include a central or masseteric shield which may be very large; a curved tympanic shield is often absent, or broken up into two or three, and if present usually separated from the upper temporal by one or two series of small shields.†

Pterygoids constantly toothed, the teeth in one or two, rarely three series.

16 to 25 gular scales in a straight line between the symphysis of the chin-shields and the median collar-plate, usually 18 to 22; gular fold distinct. Collar strongly serrated, composed of 7 to 12 plates, usually 7 to 10, which may be rather pointed.

Scales granular on the nape; on the body elongate-rhombic or hexagonal, juxtaposed or subimbricate, and strongly keeled on the back, sometimes a little smaller on the sides, often a little larger and more and more feebly keeled, or even smooth, towards the ventral shields; 40 to 55 scales, usually 42 to 50,‡ across the middle of the body; 2 or 3 lateral scales correspond to a ventral plate; 20 (♀) to 34 (♂) transverse series of scales, in the middle of the back, correspond to the length of the head. Ventral plates overlapping, the edge of the transverse series broken by notches between the plates, in 6, rarely 8, longitudinal series; the number of longitudinal series sometimes very definite, the lateral scales being abruptly differentiated, sometimes rather difficult to fix owing to the presence of small shields, which might be regarded as ventrals§; 26 to 32 transverse series, 26 to 31 in males, 27 to 32 in females; the plates of the second series from the middle line $1\frac{1}{2}$ to $2\frac{1}{2}$ times as broad as those of the first, $1\frac{1}{4}$ to 2 times as broad as those of the third; the plates of

* As a rule much larger than in the var. *major*. Werner (Sitzb. Ak. Wien, cxi, i, 1902, p. 1072) finds 8 to 32 (rarely more than 22) in the typical form and 23 to 54 in the latter. It is a tedious task to count all these shields, but I find the difference between the two forms may be as well expressed by counting them in a vertical series between the posterior third of the first upper temporal and the upper labials: we then find 2 to 5 shields in the former, and 4 to 7 in the latter—an equal degree of overlap.

† Present and separated from the upper temporal in specimens from Genoa, Turin, Elba, Lecce, Modica, Sicily, St. Malo, St. Epain, Cadillac, Prague, Bozen; in contact with the upper temporal in specimens from Genoa, Spezia, Turin, Znaim, and Herkulesbad.

‡ Usually 42–47 in French and Italian specimens, 44–50 in Austrian and Oriental.

§ I here regard the plates as in 8 series only when the outer form a continuous longitudinal series without the intercalation of scales, as, for instance, in the German specimen figured by Leydig.

the fourth series, if present, always small. Preanal plate large, bordered by two, exceptionally by one,* semicircles of smaller plates, 6 to 10 of which form the inner semicircle, the median pair sometimes enlarged, or fused to one.

Scales on upper surface of tibia as large as or smaller than dorsals, keeled. 13 to 21 femoral pores on each side.† 21 to 31 lamellar scales under the fourth toe, usually 22 to 26.

Caudal scales forming whorls of equal or nearly equal length, the upper with strong straight keel, ending in a point which, exceptionally,‡ may be very obtuse; the keel less strong and more diagonal on the lateral scales; lower scales rounded or obtusely acuminate behind, feebly keeled, those at the base usually smooth; 30 to 40 scales in the fourth or fifth whorl behind the postanal granules.

On comparing the following tables of numerical variations, it will be noticed that, on an average, the specimens from France and the Channel Islands as well as from North-Western Italy differ from the rest by a combination of characters—trifling, it is true, but not without interest: total absence or great reduction in the number of granules between the supraoculars and superciliaries, frequent absence or reduction of the anterior loreal, somewhat lower number of scales across the body (usually 42 to 47 instead of 44 to 50) and of femoral pores (usually 14 to 17 instead of 16 to 19).

In describing the coloration I will first deal exclusively with specimens from Central Europe and Italy, and afterwards allude to the somewhat differently coloured lizards of South-Eastern Europe and South-Western Asia, which have been described by Bedriaga as var. *vaillanti*.

Although, as its name implies, the green colour is one of the features of this species, there are frequent exceptions.

The young at birth is brown or greyish brown, uniform or with two or three lateral series of round white or yellowish spots, or with a white or yellowish dorso-lateral streak, and, lower down, a second streak or a series of spots extending from the upper lip, through the lower part of the tympanum, to the base of the hind limb; the upper,

* Females from Valdeblore, Ostia, Forte Ratti, and Prague.

† 13–20, usually 14–18, in French and Italian specimens, 16–21 in Sicilian, according to Boettger, 15–20 in Austrian and Oriental. Rollinat (l.c., p. 15) has stated that, in French specimens, there are often more pores under the left thigh than under the right. In 56 specimens in which the numbers are different for the two sides I find the higher number 28 times on the right and 28 times on the left. In 64 specimens of the typical form of *L. agilis*, the higher number occurs 30 times on the right side and 34 times on the left.

‡ Especially in the anterior third of the tail.

and sometimes also the lower of these lines are continued on the basal part of the tail; lower parts white.

Leydig believed that the green colour does not appear until the size of the lizard somewhat exceeds that of an adult *L. agilis*, but I have seen specimens 70 millim. long from snout to vent, of a uniform bright green on the body and tail. As the young grows, yellowish green appears on the sides of the head and body and the lower parts become yellow; small black spots may also appear on the back and the white lines or spots become edged with black. It has sometimes been stated that only very young males are striated, or even that these markings indicate the female sex of the young; but it is not so, and the light lines, although vanishing sooner than in the females, may be preserved more or less distinct in males up to a length of 106 millim. from snout to vent.* On the other hand, the striation often persists throughout life in females (*L. bilineata*, Daud.), and I will begin with a description of such specimens.

A. The retention of the light lines is sometimes accompanied by that of the brown colour. In some specimens† the ground colour is entirely brown, or green on the back and brown on the sides, or the back may be of a reddish brown.‡ A white circle is often present round the tympanum. A series of black spots, or a black streak along the inner side of the dorso-lateral white or yellowish line, or on both sides of it; the lateral line or series of spots, if present, may be also edged with black. In some specimens§ large round black spots are present all over the bright green upper parts between the white lines, and may be very crowded. The black spots unite to form a streak on the upper surface of the tail, which may be edged by the prolongation of the white dorso-lateral lines. A few white, black-edged ocellar spots may be present on the limbs, and a white, black-edged streak may run along the back of the thighs. The head may be uniform brown or olive, with or without white lines or spots from the upper lip and the superciliary border, which are continued on the body, or it may be more or less spotted with black; in one specimen‖ the head is black above, as is frequently the case in males, with about a dozen round pale green spots.

B. The next most frequent form, affecting principally adult males, but also sometimes met with in females, is the so-called var. *punctata*,

* Specimens from Jersey, Guernsey, Turin, and Sicily.

† From Cadillac and Bozen.

‡ Half-grown from Castelfranco.

§ From Jersey, Guernsey, Fontainebleau, and Biganos.

‖ From Fontainebleau.

Schreib..* in which the head and body are closely speckled black and green, or, on a black† or dark green ground, profusely dotted with yellow (var. *istriensis*, Werner); the dots are, however, larger and less densely distributed on the head, and they originate independently; only exceptionally are they very crowded. This pattern is evolved out of a crowding of small black spots, which break up, or which run together into marblings until the black forms the ground colour; we can sometimes follow the absorption of the white longitudinal lines or spots in the process of its formation (*Seps varius*, Laur.), which does not attain perfection in males until they reach a length of at least 90 millim. from snout to vent, and I have not observed it in females under 105.

c. Another form of common occurrence is green above, uniform (*L. viridis*, s. str., var. *concolor*, De Betta), or with scattered black dots or small spots (var. *maculata*, De Betta).

The three above categories are completely linked by intermediates. The following are the two most striking individual variations observed by me:

d. Male from Verona, approaching the typical coloration of the var. *major*. The scales are green, surrounded by a black interstitial skin, and each bears a black spot covering one third to two thirds of its surface; the head is dark olive above and on the sides, with numerous pale green dots and vermicular markings; the front of the limbs and the two outer ventral plates on each side (these plates are in 8 series) bear black vermiculations.

e. Female from Verona. Green above with yellowish white dots, some of which are clustered together in groups bordered with black, to form, in addition to vestiges of the two dorso-lateral streaks, irregular wavy longitudinal lines and ocellar spots; head dark olive above, with a few large, round, black-edged yellowish spots.

In green specimens the upper surface of the head, limbs and tail may be green also, but it is more frequently olive or brown.

In all these variations the sides of the head and the throat are usually of a more or less intense blue in the male during the breeding season (*L. cyanolæmus*, Glücksel.), sometimes also in the female; later in the year the blue becomes paler, or turns to lilac or greenish, or entirely vanishes. The lower parts are uniform bright yellow or greenish yellow,‡ often with the exception of the ventral plates of the

* This and other names proposed in French by Dugès have been translated into Latin by Schreiber, whose references are bibliographically incorrect.

† In a male from Valdeblore the head, body and limbs are black with yellow dots, but the anterior half of the tail is green with black dots.

‡ The "var. à ventre roux" from Italy, mentioned by A. Duméril, Arch. Mus. x, 1861, p. 436, is probably based on a *L. muralis*, var. *campestris*.

outer row, which may be green or bluish, rarely with black dots; in a male from Prague there are a few scattered black dots, in addition, on the posterior part of the belly.

Totally black specimens, above and beneath, have been observed in France, Austria, and Herzegovina (var. *nigra*, Schreib., *holomelas*, Wern.). There is one in the British Museum, a female from between Retz and Znaim, Lower Austria.*

I now pass on to the eastern specimens (Greece, Bulgaria, Roumania, Asia Minor), which have been referred by Bedriaga, Werner and Schreiber to the var. *vaillanti*, Bedr. These lizards are rarely striated, and when they are there is no light vertebral streak. Comparing them to western specimens, I am not struck by the large size of the temporal plates,† including the masseteric, as the same condition is frequent in the typical form from Central and Western Europe; on the other hand, the tympanic shield, which is nearly always absent or very small in specimens from France and the Channel Islands, is generally present, and as often as not in contact with the second upper temporal; as, however, the tympanic shield is not rarely well developed in specimens from Italy and Austria, the character cannot justify the recognition of a variety, in the Linnean or sub-specific sense in which I use the term. Occipital shorter than the interparietal and sometimes broader.‡ The number of scales across the middle of the body varies between 44 and 55, and that of femoral pores between 15 and 20.§ Ventrals in 6 longitudinal and 26 to 30 transverse series. 22 to 28 lamellar scales under the fourth toe.

Tail $1\frac{2}{3}$ to $2\frac{1}{5}$ times as long as head and body.

The largest Roumanian examples measured by Kiritzescu do not exceed 120 millim. without the tail; the largest examined by me, from Salonica, measures 136.

According to Kiritzescu, whose account is confirmed by the material before me, Roumanian specimens vary very much in colour and markings. Examples answering to the so-called vars. *bilineata*, *maculata*, and *concolor* occur, but they are rarer. Most of them vary from grey to brown or olive, without or with very small and irregular black spots; the young are mostly uniform grey or brown, often with the vertebral area darker. Some adults (Salonica) may be uniform

* Recorded by Werner, Jahresb. Nat. Ver. Magdeb. 1892, p. 245.

† 10 to 25, usually 11 to 19 (not including the upper temporals) in the specimens examined; by means of a formula generally used in describing snakes the arrangement of the anterior shields between the first upper temporal and the labials may be expressed as 2 or 3 + 2 or 3, rarely 2 + 1.

‡ As broad as the frontal in a large male from Salonica.

§ Up to 21 according to Werner.

bright yellowish green, without blue on the head; others (Zorleni, Varna, Khotz) answer pretty well to Bedriaga's description of the var. *vaillanti*, olive or brown without or with scattered black dots on the back, closely speckled with black on the sides. In the specimens from Khotz, near Trebizond, the lower parts are dotted with black—scantily in the female, more profusely in the male—and their coloration suggests certain examples of *L. agilis*.

Measurements (in millimetres):

	♂						♀					
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11	12.
From end of snout to vent	130	114	113	106	106	97	125	117	117	102	101	99
„ „ fore limb	47	43	41	42	40	38	39	41	37	35	34	33
Length of head	32	30	28	27	26	23	27	27	23	22	22	23
Width of head	22	19	18	17	16	15	18	17	15	14	15	15
Depth of head	19	17	16	16	15	13	15	15	13	12	14	12
Fore limb	44	36	38	37	34	35	41	38	35	37	36	32
Hind limb	66	57	59	64	51	60	67	51	54	47	43	47
Foot	33	29	30	32	29	31	33	33	27	29	28	26
Tail	250	—	228	286	183	247	—	253	—	227	210	170

1. ♂, Valdeblore. 2. Vöslau. 3. Hernani. 4. Turin. 5. Comana. 6. Modica. 7. Valdeblore. 8. Langoiran. 9. Korito. 10. Bozen. 11. Biganos. 12. Khotz.

A young at birth (mother from Jersey, kept by Mr. E. Britten) measures 26 millim. from snout to vent, tail 27. According to Rollinat (l.c., p. 28) the new-born measures 31 to 34 millim. to vent, tail 39 to 52. A specimen three years old has a total length of 250 millim. and is able to breed.

Particulars of Specimens Examined.

Channel Islands:	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
♂ La Corbière, Jersey	83	43	6	27	9	20	15–16	25	7–4	2	1
♀ „ „	100	42	6	31	8	19	13–14	22	3	3	0–½
♂ Jersey	102	43	6	29	9	22	15–16	24	0	2	0
„ „	102	42	6	28	9	19	15–14	22	0	2	1
„ „	100	49	6	27	10	18	17–18	24	0	2	1
„ „	93	43	6	28	9	19	13	24	3	2	½
„ „	92	45	6	27	10	18	15–17	24	0	2	1
„ „	88	44	6	26	9	17	15–16	22	0–2	2	1
„ „	86	47	6	28	9	20	16	23	4–3	3–2	2–3
„ „	83	48	6	27	9	20	16	22	6–3	2–3	3–2
„ „	83	43	6	27	9	20	15–16	24	2–3	2	2–½
„ „	82	44	6	27	10	19	15	24	0	2	1
„ „	82	46	6	27	11	20	16	22	3–1	2	2–1
„ „	74	44	6	30	10	18	16–15	25	0	3–2	½
„ „	92	45	6	30	9	20	15	24	4–3	3	2

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
♂ Jersey	90	43	6	29	9	18	16-15	27	1	2	1
♀ „	91	42	6	29	9	18	14-16	26	0	2	1
„ „	87	41	6	30	9	20	14-15	25	0	3-2	0
„ „	77	46	6	30	9	18	14-15	23	3	3	1
♂ Guernsey	82	47	6	28	10	19	15	22	0	2	1
France:											
♀ St. Malo	112	43	6	31	8	20	15	23	2-1	2-1	0-2
„ „	108	46	6	31	9	21	16	23	6	2	0
„ „	105	43	6	30	9	18	17-15	25	8-5	2	1
„ „	97	42	6	31	9	22	17	24	0	2	½-2
♂ St. Epain, Indre-et-Loire	111	49	6	30	7	19	16-17	23	1-0	3-2	½
♀ „	112	42	6	28	8	19	14	22	0	3	0
„ „	107	42	6	29	9	19	15-16	22	0-1	2	½-0
„ „	95	46	6	29	8	21	14-15	22	2-1	2	0
„ Lignières-Sonneville, Charente	71	47	6	30	9	22	15-14	25	1 0	2	1
„ Oléron Id.	112	40	6	30	8	20	16-17	22	0	2	1
„ „	109	41	8	29	8	20	14-15	23	0	2-3	½-0
„ „	92	42	6	29	8	17	13-14	23	1-0	2	1
„ Cadillac, Gironde	106	50	6	30	9	20	15-16	25	7 8	2-3	0
„ „ „	72	42	6	30	8	19	17-16	24	0	2	1
„ Biganos „	101	47	8	30	8	18	17-16	24	2-1	2	1
„ Langoiran „	117	49	6	30	9	22	18-17	26	0	2	1
„ Verrières, near Paris	99	43	6	32	10	20	15-16	27	6-7	2	½
„ Fontainebleau	111	42	6	30	10	20	15-16	22	4 1	2	0
„ „	93	45	6	30	10	22	15-16	26	4 3	3-2	0-1
„ Yonne	90	45	6	30	7	20	15	25	3 5	2	0
♂ Méginant-Tassin, near Lyons, **L.M.**	122	46	8	29	9	22	16	24	3	3	0
„ Uriage, Isère	93	44	6	28	9	21	15	25	5-4	2	1
„ Montpellier	73	44	6	28	10	20	17	24	0	2	1-½
♀ „	112	45	6	30	9	20	16-14	22	1	2	0
„ „ **L.M.**	115	45	6	30	8	18	17-15	25	5-4	2	1
„ Cannes	110	47	8	29	9	20	19-20	26	10	2	1
„ „	105	47	8	28	9	23	17-16	24	8-4	2	1
„ „	93	45	6	28	8	19	17	25	5 4	2	1
♂ Valdeblore, Alpes-Maritimes, 1000 m.	130	48	8	29	9	18	20-17	22	1	2	0
„ „	110	46	8	28	10	19	18	25	0	2	1
„ „	110	45	6	28	10	18	18	25	0	2	1
♀ „	125	46	6	28	8	20	17-16	26	0	2	0
„ „	117	46	6	29	8	18	15	23	0	2	1
„ „	117	47	6	29	10	20	17	23	2-1	2	1
„ „	105	45	6	29	9	16	15-14	24	0	2	1
Spain:											
♂ Hernani, Guipuzcoa	113	51	6	28	8	20	16	26	9-8	2	1

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Italy:											
♀ Forte Ratti, Genoa	106	42	6	29	7	19	16 14	25	4	2	1
„ Stegnoni, Spezia	111	46	6	28	9	18	16	24	0	2-1	1
♂ Turin	120	45	6	27	9	21	18	26	2 1	2	0 1
„ „	106	44	6	28	7	18	15–17	25	1	2	1
„ „	106	45	6	28	7	20	18	26	1 0	2	½ 1
„ „	102	46	6	27	7	19	17	23	0	3	0
„ „	98	45	6	28	9	20	17 16	23	5	2	1
„ „	91	47	6	28	7	20	16	24	3	2	1
„ „	88	45	6	28	8	21	16	25	0 2	2	1
♀ „	127	47	8	30	10	23	16	31	6 7	2	1
„ „	105	44	6	31	8	19	13–15	23	0	2	2
„ „	93	43	6	31	8	22	16 14	23	4 3	2	0
„ „	93	45	6	29	8	23	17 16	24	0	2	1
„ „	93	45	6	29	8	20	17	24	0	2	1–0
♀ Bozen, Tyrol	102	48	6	30	9	25	19 18	24	9–8	2	1
„ „ „	99	42	6	31	9	20	16 18	25	3–4	2 3	0
„ „ „	97	47	6	31	9	23	17	26	7 4	2	1
♂ Verona	117	43	8	26	7	17	16	25	4–3	2	1
♀ „	117	45	6	31	9	21	16	25	7–4	2	1
„ „	105	48	6	30	9	19	18 16	25	9 11	2	1
♂ Perugia	98	47	6	28	9	16	18–19	25	9–8	2	1
„ Castelfranco, Ostia	90	48	6	29	9	21	18	30	5	2	1
♀ „ „	120	45	6	28	8	19	18–20	30	7 5	2	1
„ „	118	44	6	30	7	23	16	28	8	2	1
„ „	118	44	6	28	9	19	18 19	30	7 5	2	1
„ Lecce, Otranto	114	44	8	28	9	25	19	26	9–7	2	1
„ „ „	90	47	8	31	7	20	17 18	28	10 7	2	0
♂ Modica, Sicily	113	46	8	28	9	19	16	25	4–0	2	1
„ „	97	41	8	29	9	20	18 17	25	9–8	2	1
„ „	97	46	6	27	9	22	18	25	8	2	1
♀ Sicily, **P.M.**	97	42	8	29	10	18	15–14	21	4 3	2	½
Bohemia:											
♂ Prague	117	52	6	28	8	20	18	25	9 6	2	1
♀ „	110	44	6	31	9	19	17	24	8 7	2	1
„ „	102	48	8	29	11	22	17 18	23	6	2	2
„ „	97	50	6	31	9	19	18–19	25	9 10	2	1
„ „	93	49	6	31	9	24	20 18	27	6	2	1
Austria:											
♂ Vöslau, Low. Austria	114	45	6	28	10	19	17–15	22	3–4	2	1
„ Hardegg „	95	54	6	28	9	19	17 18	27	1	2	1
♀ Znaim, S. Moravia	109	45	6	31	10	21	16–15	22	9–7	2	1
„ „ „	98	45	6	30	12	19	15	21	8 9	2	1
„ „ „	98	47	6	29	10	22	18–17	24	5–3	2	2
„ „ „	95	48	6	31	9	17	16	24	2 3	2	1
♂ Retz-Znaim „	93	50	6	28	9	21	18–17	24	4 3	2	1
Hungary:											
♀ Kis-Pest, nr. Budapest	93	48	6	29	11	19	17–16	24	7–4	2	1

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
♀ Kis-Pest, nr. Budapest	84	46	6	29	10	20	17	22	2	2	2
„ „ „	69	51	6	27	9	22	18	23	8–7	2	1
♂ Bazias	103	46	6	29	9	20	17	25	5	2	1
♀ „	88	46	6	30	10	18	16–15	25	7	2	1
Dalmatia, Bosnia, Herzegovina:											
♂ Cattaro, Dalmatia	122	50	8	28	9	20	20	26	7–9	2	1–2
♀ „ „	135	50	6	29	10	19	17	28	7–8	2	1
♂ Travnik, Bosnia	102	50	6	31	10	23	19–18	24	7–6	2	1
♀ „ „	83	48	6	30	8	22	19–18	27	1	2	1
„ Livno „	72	49	6	29	9	20	16–18	24	4–5	2	1
„ Korito, Herzegovina	117	44	6	31	10	22	16–17	22	3–1	2	1
„ „ „	98	42	6	32	9	16	16–17	23	1–2	2	2
Bulgaria:											
♀ Varna	103	47	6	29	9	20	19–18	24	12	2	1
Greece:											
♂ Salonica	136	50	6	28	9	18	20–17	28	8–6	2	1
„ „	133	48	6	28	8	19	16–17	29	10	2	1
♀ „	90	55	6	27	9	21	20	28	7	2	1
Roumania:											
♂ Herkulesbad, Transylvania	98	52	6	28	10	20	18	26	5–3	2	1
♀ „	110	53	6	30	11	22	19	25	2–3	2	1
♂ Bukarest	99	55	6	27	9	24	18	27	7	2	1
„ „	99	49	6	29	9	16	16–15	24	4	2	1
„ Comana	106	50	6	26	10	20	15	24	7–6	2	1
♀ „	103	49	6	30	10	20	17–16	24	3–2	2	1
„ „	94	44	6	28	9	19	16–15	25	10	2	1
„ „	87	51	6	28	9	18	15	25	16–9	2	2
„ „	85	50	6	30	11	21	16	27	6	2	1
♂ Zorleni	85	48	6	26	9	19	16–17	25	10	2	1
♀ Greci	87	47	6	28	9	23	16–15	24	9–6	2	1
„ Macin	88	47	6	28	10	22	19–18	28	4–6	2	1
Asia Minor:											
♂ Khotz	82	50	6	27	7	21	17	24	6–7	2	1
♀ „	99	52	6	27	10	24	17	22	6–3	2	1–0
♂ Persia (?), type of v. *vaillanti*, **P.M.**	75	51	6	27	10	20	17	25	0–1	2	1
„ „ „ „	70	50	6	27	11	18	15–16	25	3–2	2	1

1. Length from snout to vent (in millim.). 2. Number of scales across middle of body. 3. Longitudinal series of ventral plates. 4. Transverse series of ventral plates. 5. Plates in collar. 6. Gular scales in longitudinal series. 7. Femoral pores (R. & L.). 8. Subdigital lamellæ. 9. Superciliary granules. 10. Postnasals. 11. Anterior loreals.

Habitat. — The range of the typical *L. viridis* extends over a considerable part of Central and Southern Europe: France, with the Islands of Jersey and Guernsey and the neighbouring Spanish provinces

of Catalogna and Guipuzcoa, south of a line drawn from Rouen to Basle, a few isolated localities on the Rhine, south of Coblenz, Switzerland, Italy and Sicily, Bohemia, Austria, Hungary and the Balkan Peninsula, north of a line extending from Montenegro to Constantinople; a few isolated localities near Berlin and Warsaw. Its range in Russia has still to be determined, owing to confusion with the var. *strigata*, but it certainly occurs in the Kieff Government and probably down to the mouth of the Dnieper.* It is also known from the northern parts of Asia Minor, as far east as Trebizond. Whether it extends to Persia, whence the types of the var. *vaillanti* are supposed to have come (Coll. Aucher-Eloy), is very doubtful.† Highest altitude in the Alps about 1700 metres.‡

Var. STRIGATA.

Lacerta strigata, Eichw. Zool. Spec. Ross. Pol. iii, p. 189 (1831), and Faun. Casp.-Cauc. p. 70, pl. x, figs. 4–6 (1841); Gray, Cat. Liz. p. 32 (1845); Schreib. Herp. Eur., ed. 2, p. 485 (1912).

Lacerta quinquevittata, Ménétr. Cat. Rais. p. 61 (1832).

Lacerta viridis, var. *strigata*, De Filippi, Viagg. Pers. p. 354 (1865); Anders. Proc. Zool. Soc. 1872, p. 372; Kessler, Tr. St. Petersb. Nat. Soc. viii, 1878, p. 146; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 89; Boulenq. Cat. Liz. iii, p. 17 (1887); Boettg. Ber. Senck. Ges. 1892, p. 138; Nikolsky, Fedschenko's Reise, Zool. ii, pt. vii, p. 30 (1899), and Herp. Ross. p. 97 (1905); Steind. Ann. Hofmus. Wien, xx, 1905, p. 307.

Lacerta viridis, Boettg. Ber. Senck. Ges. 1879–80, p. 170, and in Radde, Faun. Flor. Casp.-Geb. p. 39 (1886).

Lacerta viridis, part., Steind. Denkschr. Ak. Wien, lxiv, 1897, p. 696.

Lacerta viridis, var. *major*, Kiritzescu, Bul. Soc. Sc. Bucur. x, 1901, p. 305; Werner, Zool. Jahrb., Syst. xix, 1903, p. 331; Kowatcheff, Herp. Faun. Bulg. p. 24 (1912).

* These Russian specimens have, according to Kessler, 48 to 52 scales across the body, as against 42 to 46 in the var. *strigata*.

† The botanical collector Aucher-Eloy travelled in 1835–38 over considerable parts of Asia Minor and Persia, and also stayed at Constantinople. After his death, at Ispahan, in 1838, his collection of Reptiles was purchased by the Paris Museum, and all the specimens were labelled *en bloc* in that institution as from Persia, no localities being appended. Some of them, *Lacerta taurica* and *Chamæleon vulgaris*, for instance, were certainly not obtained in Persia.

‡ Obtained at that altitude in the Alpes-Maritimes at Lioson, above St. Etienne de Tinée, by M. Gaston de Witte.

Lacerta viridis, var. *major*, part., Werner, Sitzb. Ak. Wien, cx, 1, 1902, p. 1071.

Lacerta viridis strigata, Nesterov, Ann. Mus. Zool. St. Pétersb. xvii, 1912, p. 76; Nikolsky, Herp. Caucas. p. 45 (1913).

This is undoubtedly the most primitive form of *L. viridis*, probably directly derived from *L. agilis*, var. *exigua*. Like the latter it has, when young, a light vertebral streak, of which not even traces ever occur in the typical form of *L. viridis*, and the ventral shields are in 6 or 8 longitudinal rows. When adult it often so closely resembles the var. *major*, that, even up to quite recently, it has been confounded with it, through neglect of the two principal characters that have been adduced in favour of their distinction, viz. the size of the occipital shield and the number of scales across the body. The confusion is excusable, as there is a complete passage between the two forms, which must render the naming of certain specimens somewhat arbitrary.

Head as in the typical form, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, the pileus 2 to $2\frac{1}{2}$ times as long as broad, its length $3\frac{2}{3}$ to 4 times in length to vent in males, $4\frac{1}{3}$ to $4\frac{1}{2}$ times in females. The hind limb reaches the shoulder or the collar in males, the wrist, the elbow, or the axil in females; foot 1 to $1\frac{2}{5}$ times as long as head. Tail $1\frac{3}{4}$ to $2\frac{1}{2}$ times as long as head and body.

The rostral enters or merely touches the nostril. The occipital is always much shorter than the interparietal, $\frac{1}{4}$ to $\frac{1}{2}$, rarely $\frac{2}{3}$, its length very rarely exceeding its width.* Granules are nearly always present between the supraoculars and the superciliaries, and sometimes form a complete series; their number varies from 2 to 12.† First supraocular constantly in contact with the second loreal, which often forms a suture with the second upper labial. 4 anterior upper labials, rarely 5 or 3‡; subocular much narrower beneath than above. First upper temporal longer than second; temporal shields usually small, but variable, 18 to 38 in number,§ sometimes with a masseteric, which may be large or

* In the young usually much narrower than the interparietal. Totally absent in a female from Erivan in the Lyons Museum. In a male from Borshom the interparietal is produced between the frontoparietals and reaches the frontal.

† Kessler had already observed that they may be reduced to 2 or 3. I have noted their complete absence in a female from Erivan, in the Lyons Museum.

‡ 3 on the right side in a specimen from Erivan, 5 on both sides in two specimens from Isfahan, on the right side in single specimens from Angora, Lake Homs, east of Mount Hermon, and Merom, on the left side in one from Elisabethpol and in one from Merom.

§ I count 18–38 in the Syrian specimens, 18–36 in the others.

small; tympanic constantly present, usually separated from the second upper temporal by one or two series of small shields *; 16 to 22 gular scales; 7 to 12 plates in the collar, usually 9 to 11. Scales of nearly equal size on the back and sides, dorsals rhombic-hexagonal to roundish, strongly keeled, 38 to 49 across the middle of the body, 20 (♀) to 35 (♂) transverse series on the back corresponding to the length of the head. Ventral plates in 6 or 8 series; if in 8, outer plates very small; 24 to 30 transverse series in males, 27 to 30 in females. Preanal plate bordered by two, exceptionally by one, semicircles of small plates. 12 to 22 femoral pores on each side, usually 15 to 19. 23 to 30 lamellar scales under the fourth toe, usually 25 to 28. Upper caudal scales usually pointed behind †; 30 to 44 scales in the fourth or fifth whorl.

The coloration varies greatly, but the young are always provided with three light dorsal streaks. I will first describe the differences shown by the young.

A. (Rutshuk, Smyrna, Angora and Shiraz.) Olive or brown above, with 3 white or greenish-white streaks along the back and one on each side from the upper lip, through the tympanum, to the base of the hind limb. In the three Smyrna specimens and in that from Rutshuk the vertebral streak does not reach the occiput and in the two from Angora it bifurcates just before reaching the occiput. The type figured by Eichwald, a half-grown female, is represented as brown, likewise with 5 white streaks on the body, the vertebral extending to the occiput, and no white spots; so are also females from Erivan, and the half-grown female from Aschar-Adé Island, which I regard as representing *L. strigata* in the narrowest sense.

I am indebted to M. L. Lantz for photographs of young and half-grown quinquelineated Caucasian specimens obtained by him at Michrilowa (Borshom) and near Jevlaka.

B. (Helenendorf.) Like the preceding, but the vertebral streak extends to the occiput, the lateral streak is partly broken up into spots, and there is a series of round white spots between it and the dorso-lateral streak, whilst another extends along each side of the belly. Such specimens cannot be distinguished, so far as colour and markings are concerned, from the young *L. agilis*, var. *exigua*, occurring also in Transcaucasia.

* In contact in a male from Taurida, in a female from Aschar-Adé, in a young from Shiraz, in two young from Smyrna, and in four specimens from Erivan. Curiously, Schreiber, in his key to the species of *Lacerta* (p. 382), gives "Tympanale vorhanden und mit dem letzten Supratemporale zusammenstossend" as the only structural character by which to distinguish *L. strigata* from *L. viridis*.

† Obtusely in a specimen from Elisabethpol.

c. (Island on Lake Homs.) Brown above, with small black spots, with three white dorsal streaks, the median from the occiput, the dorso-laterals from the superciliary border; the space between the dorso-laterals and the lateral streak black, with round white spots, the anterior of which are confluent with the dorso-lateral streak.

d. (Lake Homs.) Very similar to the preceding, but the greenish-white vertebral streak bifurcates just before reaching the occiput and the light spots form vertical bars on the side of the neck; a series of white spots along the side of the body.

e. (Lake Phiala and Ferzol.) The light dorsal streaks as usual, except that the vertebral does not reach the occiput in the Ferzol specimens; the spaces between them very dark brown. Very numerous white spots on the sides of the body, forming four or five longitudinal series; some of them may be confluent into vertical bars—a feature also met with in the young of the var. *schreiberi*.

f. (Jerusalem.) Like the preceding, but the vertebral streak forked on the nape and broken up by black spots further down the body. Sides with very numerous round light spots, but no light streak.

These markings disappear with age, although they may be preserved to some extent in adult females or even in males. As the streaks vanish, the head and body may become more and more spotted or marbled with black and the ground colour assume a green tint; adult males from Syria and Asia Minor are bright green, closely speckled with black as in the var. *major*, the head being finely speckled or vermiculate with black. No blue on the head. End of tail often reddish yellow, even in green specimens. Lower parts yellow, sometimes finely speckled, all over or only on the sides, in males, rarely in females.

Measurements (in millimetres):

	1.	2.	3.	4.
From end of snout to vent .	93	88	126	108
,, ,, ,, fore limb .	35	30	49	35
Length of head	24	20	32	23
Width of head	16	13	20	15
Depth of head	14	11	19	14
Fore limb	31	28	43	35
Hind limb	52	46	75	57
Foot	28	25	40	33
Tail	170	175	270	195

1. ♂, Borshom. 2. ♀, Elisabethpol. 3. ♂, Damascus-Ataïbé. 4. ♀, L. Homs.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Yg. Rutshuk, Bulgaria .	43	44	8	30	9	21	16	27	8	2	1
♂ Taurida, **P.M.**	88	41	6	26	12	18	18	25	6–7	2	1
♀ Aschar-Adé Id., Caspian Sea . .	78	40	6	29	9	21	19	25	9 11	2	1
♂ Elisabethpol, Transcaucasia . .	76	44	6	27	10	20	20	26	12-10	2	2
♀ „ . . .	88	43	6	28	9	22	19–18	25	10 8	2	1
Yg. Helenendorf, Transcaucasia . .	63	49	6	28	10	17	13	25	8–9	2	2 1
♂ Borshom, Transcaucasia . . .	107	48	6	28	11	20	13	23	9–11	2	1
„ „ . . .	93	48	6	25	12	19	12	25	8–9	2	1
„ Erivan, Transcaucasia, **L.M.** . .	87	39	6	27	11	16	14–15	23	8–5	2	1
„ „ „ . .	86	43	6	27	11	19	18	25	6	2	1
„ „ „ . .	79	39	6	27	10	17	16–18	24	3	2	1
„ „ „ . .	78	41	6	27	10	17	18–17	25	6–4	2	1
„ „ „ . .	78	44	6	26	9	19	19	25	7–8	2	1
„ „ „ . .	78	41	6	27	11	17	16	25	5–4	2	1
♀ „ „ . .	86	40	6	29	9	19	18	25	5–6	2	1
„ „ „ . .	85	40	6	29	10	19	17	23	4	2	1
„ „ „ . .	82	40	6	30	10	19	19–18	27	4	2	1
„ „ „ . .	77	38	6	28	10	19	18	26	2–3	2	1
„ „ „ . .	77	38	6	29	11	19	18	25	2–3	2	1
„ „ „ . .	75	41	6	28	11	18	17–18	24	6	2	1
♂ Angora, **G. K. C.** .	138	42	8	30	10	16	15–14	24	6	2	1
„ „ „ . .	118	41	8	30	11	16	14	24	5 4	2	1
„ „ . .	106	42	8	30	9	18	14–15	25	8–9	2	1
Yg. „ . .	38	40	8	30	10	19	15–16	25	4 3	2	1
„ Smyrna . . .	62	45	8	30	9	17	16–14	28	6	2	1
„ „ . . .	58	47	8	28	9	17	15	30	8	2	1
„ „ . . .	53	49	8	27	10	22	18	30	11	2	1
♂ Aleppo, **L.M.** . .	95	45	6	29	11	21	17–18	27	9–6	2	1
„ Ferzol, Lebanon .	100	46	6	25	11	20	17–19	27	6–7	2	1
„ „ „ .	80	47	6	24	11	19	18	27	6–5	2	1
„ L. Homs . . .	112	49	6	27	11	20	17–16	27	8–7	2	1
♀ „ . . .	108	45	6	27	9	20	18	27	7–9	2	1
„ „ . . .	106	47	6	30	9	19	16–17	26	4 3	2	1
Yg. „ . . .	57	47	6	26	10	18	17–16	26	7–6	2	1
♂ Island on L. Homs .	75	46	6	26	9	17	17	28	6–5	2	1
„ Damascus-Ataïbi .	126	43	6	25	9	21	17	28	6	2	1
♀ L. Houleh, **L.M.** .	116	46	6	27	11	22	18	28	9–8	2	1
„ „ „ .	115	44	6	28	9	21	17–15	27	6	2	1
Yg. L. Phiala under Mt. Hermon . .	69	42	6	27	10	19	18–19	26	5 7	2	1
„ „ . . .	69	40	6	26	11	19	18	28	6–8	2	1
									6		

	1.	2.	3.	4.	5	6.	7.	8.	9.	10.	11.
♂ E. slope of Mt. Hermon . .	110	48	6	26	9	18	18	26	6–7	2	1
„ Merom . . .	115	45	6	25	9	19	17	26	7–5	2	1
„ „ . . .	112	44	6	25	11	21	19–18	29	7	3	1
♀ Tiberias, **P.M.** . .	97	40	8	28	10	21	17–16	29	10–7	2	1
Yg. Jerusalem . .	52	41	6	25	11	21	16–17	27	6–5	2	1
„ Shiraz, Persia, **I.M.** .	58	42	6	27	10	20	19	27	6–7	2	1
„ „ . . .	49	48	6	27	9	19	22–21	27	12–11	2	1

Columns as in the preceding table.

Habitat.—From Bulgaria and the Danube Delta to Cis- and Transcaucasia, Asia Minor, and Syria (in the Lebanon up to 3000 metres). Probably occurs also in Turkey in Europe together with the var. *major*. Much uncertainty is likely to remain in the drawing of the line of distribution of this form owing to the complete passage between it and the var. *major*. The annectant specimens to which I allude are of especial interest in view of the recent proposal to treat *L. strigata* and *L. major* as distinct species.

Kessler, who was the first to properly define this lizard, correctly referred it to *L. viridis* as a variety remarkable in all respects and establishing a connexion with *L. agilis*.*

Var. MAJOR.

Lacerta viridis, Bibr. & Bory de St. Vinc. Expéd. Sc. Morée, Zool. p. 66, pl. x, fig. 1 (1833); De Betta, Rett. Anf. Grec. p. 32 (1868); Bedriaga, Bull. Soc. Nat. Mosc. 1881, p. 71.

Lacerta merremii (non Risso), Schinz, Eur. Faun. ii, p. 25 (1846).

Lacerta quinquevittata (non Mén.), Erhard, Faun. Cycl. i. p. 80 (1858).

? Tropidosaura algira, Erhard, l.c.

Lacerta viridis, var. *ocellata*, Erber, Verh. Zool.-bot. Ges. Wien, xiv, 1864, p. 701.

Lacerta viridis, var., Leydig, Deutschl. Saur. p. 190 (1872).

Lacerta viridis, var. *fusca*, Bedriaga, t.c. p. 76.

Lacerta viridis, var. *aurata*, Bedriaga, l.c.

Lacerta viridis, vars. *punctata* et *trilineata*, Bedriaga, Abh. Senck. Ges. xiv, 1886, pp. 98, 99.

Lacerta viridis, var. *major*, Bouleng. Cat. Liz. iii, p. 16 (1887); Boettg. Sitzb. Ak. Berl. 1888, p. 157; Werner, Verh. Zool.-bot. Ges. Wien, xliv, 1894, p. 229, Rept. Amph. Oesterr.-Ung. p. 31, pl. ii, fig. 1 (1897), and Wiss. Mitth. Bosn. Herzeg. vi, 1899, pp. 819, 832;

* A German translation of Kessler's remarks (in Russian) has been given by Bedriaga, Bull. Soc. Nat. Mosc. 1881, p. 78.

Kolombat. Zool. Vij. Dalm. p. xxi (1900) ; Lehrs, Zool. Jahrb., Syst. xxviii, 1909, p. 103, pl. ii, fig. 4.

Lacerta viridis, var. *major*, part., Werner, Sitzb. Ak. Wien, cx, i, 1902, p. 1071.

Lacerta major, Schreib. Herp. Eur., ed. 2, p. 499 (1912).

Lacerta major, var. *subocellata*, Schreib. op. cit. p. 502.

I was the first to define, as a race or variety, this form, individuals of which had previously been referred to colour-varieties of the typical *L. viridis* (*punctata*) or of the var. *strigata* (*quinquevittata*, *trilineata*). The diagnosis was as follows: "A larger form, attaining nearly to the size of *L. ocellata*. Constantly a series of granules between the supraoculars and superciliaries; occipital usually as broad as or a little broader but shorter than the interparietal; temporal scales smaller than in the typical form, usually with a very distinct tympanic shield. 50 to 58 scales across the middle of the body, the laterals not larger than the median dorsals. Usually a well-developed additional series of ventrals, making in all eight longitudinal rows. Femoral pores 15 to 20. Young olive above, usually with three or five yellowish longitudinal streaks, the lowermost of which, extending from axilla to groin, is often replaced by a series of round spots, these bands usually disappearing in the adult, which are green on the body and limbs, uniform or finely speckled with black; upper surface of head vermiculated with black; lower surfaces yellow, the outer ventrals often speckled with black; throat never blue." I still regard this as a good definition of the var. *major* (only requiring slight modification owing to the larger material now before me), which has since been raised to the rank of species by Schreiber, influenced no doubt by the remarks of Werner, who has expressed the opinion that it is morphologically the most distinct of the forms into which *L. viridis* must be divided. I have unfortunately not had access to the material on which Werner based his revised account in 1902, but I cannot help doubting whether all the specimens included by him under var. *major* should really be referred to that form. In commenting on my definition he says he cannot find any difference in the number of scales, since these vary between 42 and 52 in *L. viridis typica* and between 42 and 54 in the var. *major*.* And the 11 specimens tabulated by him from Asia Minor have only 42, 44, and 46 scales across the middle of the body,

* I am not able to confirm Werner's statement (1902, p. 1074) that the number increases in the course of growth of the individual, through disintegration.

whilst he also refers, in the synonymy, to notes by Steindachner on nine specimens from Angora with 46, 42, and 38 scales. As I happen to be acquainted with the Angora lizard, which is certainly not identical with the var. *major*, I must come to the conclusion that Dr. Werner's material requires revision, and that therefore his objection to using the number of scales for distinguishing the var. *major* is unjustified. As may be seen from the tables given in this paper, the typical form has 40 to 50 scales, only very exceptionally up to 55, and the var. *major* 50 to 58. The difference in the number of scales is therefore amply sufficient for the definition of a variety, especially as it goes hand in hand with the character of the occipital shield, which Werner says is not distinctive; but I find this shield to be usually, if not constantly, considerably larger in the var. *major*, in some specimens even comparable to that of an average *L. ocellata* of the var. *pater*. Werner himself* has figured a specimen from Zara, Dalmatia, in which the occipital is fully three times as large as the interparietal; nothing approaching this has ever been found in the typical form. Leydig also was struck by the large size of the occipital in Greek specimens ("sehr gross . . . bei zwei 20 Zoll [= 520 millim.] langen Exemplaren aus Griechenland"), and Schreiber says, "das Interparietale ist bedeutend kleiner als das Occipitale." Suspecting Werner to have confounded examples of the var. *strigata*, as I conceive it, with the var. *major* in his account of the lizards of Asia Minor, I will abstain from referring to his statements in drawing up the following description.

In size and in the massive build adult males approach *L. ocellata*, and the snout is likewise more pointed and the cheeks strongly swollen. The length of the head is $3\frac{2}{3}$ to 4 times in the length to vent in males, $4\frac{1}{4}$ to 4 times in females; pileus 2 to $2\frac{1}{3}$ times as long as broad; the upper surface of the head is usually very uneven in adult males.

The proportions of the limbs vary, but the hind limb always reaches at least as far as the axil in males, the elbow in females. Foot 1 to $1\frac{2}{5}$ times the length of the head in males, $1\frac{1}{3}$ to $1\frac{2}{5}$ times in females.

Tail $1\frac{2}{3}$ to $2\frac{1}{2}$ times the length of head and body.

The head-shields are as in the typical form, except in a few points included in the following notes: The rostral always largely enters the nostril; the occipital, in the adult, may be shorter than and as broad as the interparietal, but it is often as long and once and a-half to twice

* Rept. Amph. Oesterr.-Ung. pl. ii, fig. 1.

as broad as that shield*; there is always a series of granules (2 to 13) between the supraoculars and the superciliaries, and the series is often complete or nearly so and may be partly double; the first supraocular is constantly in contact with the second loreal, which nearly reaches the second upper labial; 4 upper labials anterior to the subocular, rarely 5†; 2 or 3 large upper temporals, the temporals below them usually smaller than in the typical form, 17 to 52, including the tympanic, which is nearly always well developed and separated from the upper temporals by one or two series of scales; masseteric sometimes absent, often present but small, sometimes large.‡

Collar composed of 7 to 13 plates, usually 9 to 11.

Scales rhombic-hexagonal, sometimes oval or but little longer than broad, strongly keeled on the back, of nearly equal size; 50 to 58 across the middle of the body§; 27 (♀) to 36 (♂) transverse series, in the middle of the body, correspond to the length of the head. Ventral plates in 6, more often in 8 longitudinal series, the outer plates, when 8 series are present, smaller than those next to them; 27 to 31 transverse series in males, 29 or 30 in females. Preanal plate bordered by two, exceptionally three, semicircles of small plates. 25 to 31 lamellar scales under the fourth toe, usually 27 to 30. 13 to 20 femoral pores on each side, usually 15 to 19.‖

34 to 44 caudal scales in the fourth or fifth whorl behind the postanal granules.

The young, as a rule, are brown or olive above, with three white or yellow dorsal streaks, proceeding from the superciliary border and from the occipital, the median terminating on the base of the tail, the laterals extending a little farther; another light streak, often broken up into a series of round spots, extends from the tympanum, which is usually bordered with white, to the hind limb, passing above the fore limb; a few round light spots are sometimes present between the dorsolateral and lateral streaks, above the shoulder, and there may be a series of round spots along each side of the belly; white spots are sometimes present on the hind limbs. In some specimens the vertebral

* The shield is, of course, much shorter in proportion in the young, but its width is usually equal to that of the interparietal.

† In the two specimens from N.W. of Ispahan.

‡ Male from Milos, in which the temporal lepidosis is very similar to that of a large male of the typical form from Verona, which in some respects approaches the var. *major*.

§ 57 to 65 in specimens from Crete, according to Boettger.

‖ Werner (Wiss. Mitt. Bosn. Herz. viii, p. 832) mentions a female from the Peloponnesus with only 12–13 femoral pores.

streak may be interrupted* or absent,† or the light markings may be reduced to the lateral series in the form of spots.‡ With age small dark spots or marblings appear on the head and body, and the light streaks or spots acquire dark edges.

In the adult, the light markings usually disappear§ and, although the brown colour is exceptionally retained (var. *fusca*, Bedriaga‖), the upper parts assume a bright green or yellow (var. *aurata*, Bedr.) colour and the dark spots or marblings break up into a fine black puncticulation, usually one black dot on every scale of the body and limbs, one or several, or a black vermiculation, on the scales of the tail, which is brown at least in its posterior third; the head is brown or green with blackish vermiculations, or dark olive on the pileus with very crowded green dots or vermiculations. End of tail often reddish. The evolution of these markings is the same as in the speckled specimens of the typical form. Under the name of var. *subocellata*, Schreiber mentions Dalmatian examples with a lateral series of 6 blue spots. The lower parts are yellow, sometimes speckled or vermiculate with black on the outer or the two outer ventral plates. Never any blue on the sides of the head or on the throat.

I have examined two female melanic specimens, blackish above but showing the black markings after preservation in spirit, yellow beneath. One, from Dalmatia, was exhibited in our Zoological Gardens, the other was purchased of a dealer, F. Henkel, as from Klosterneuburg, near Vienna—no doubt an erroneous locality.

This form is known to attain a total length of over half a metre.

	1.	2.	3.	4.
Measurements (in millimetres) :				
From end of snout to vent . .	147	133	125	115
„ „ fore limb .	59	49	48	42
Length of head	41	34	32	26
Width of head	28	24	22	17
Depth of head	22	19	19	14

* Zara.

† Smyrna.

‡ Albania, Athens, L. Stymphalos, Syra.—Also reported by Werner (1894) from the Ionian Islands.

§ Very distinct traces of three dorsal streaks persist in a male from Dalmatia measuring 126 millim. from snout to vent, and Werner (1894) has recorded adult quinquestriated females from Dalmatia and Corfu. Werner is evidently wrong when he concludes, from the fact that he has come across young with and without the streaks, that the former are probably females and the latter males.

‖ From Milos.

	1.	2.	.	4.
Fore limb	50	45	44	37
Hind limb	80	77	75	61
Foot	44	40	38	32
Tail	—	300	295	235

1. ♂, Zara. 2. ♂, Milos. 3. ♂, Rhodes. 4. ♀, Crete.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
♂ Zara	147	52	8	28	9	20	16–17	29	10–7	2	1
„ „	123	51	6	31	8	19	16	29	9–10	2	1
„ „	87	50	8	29	9	17	14	25	8 .	2	1
„ Dalmatia . . .	160	53	8	28	10	20	15–16	30	5–6	2	1
„ „ . . .	157	50	8	29	10	20	17	26	8	2	1
„ „ . . .	126	52	8	29	11	19	15–16	28	6–4	2	2–1
„ „ . . .	140	55	8	29	11	21	17–16	28	6–9	2	1
♀ „ . . .	135	51	8	30	9	19	16–15	30	7–2	2	1
„ „ . . .	126	51	8	30	10	19	16–17	28	9	2	1
Yg. Albania . . .	37	57	8	29	9	18	15	30	10–9	2	1
♂ Greece . . .	95	52	8	28	10	19	17	28	11	2	1
„ „ . . .	95	51	8	27	10	23	19–18	29	11–10	2	1
„ Salonica, **P.M.** . .	140	50	8	29	8	21	16	26	9–10	2	1
Yg. Athens . . .	74	54	8	27	10	20	17–18	30	11	2	1
♀ Morea, **P.M.** . .	150	51	6	30	8	24	19–18	27	10	2	1
„ „ „ . .	102	51	8	29	10	23	19	29	8	2	1
Yg. L. Stymphalos .	62	53	8	28	10	20	18–17	27	6	2	1
„ Sta. Maura . .	48	55	6	28	8	19	18	31	5–4	2	1
♂ Corfu, **P.M.** . .	132	55	8	28	10	19	17–16	29	9	2	1
♀ „ „ . .	128	51	8	30	8	20	16–17	29	10–8	2	1
„ „ „ . .	94	54	8	29	9	19	17	27	7–8	2	1
♂ Milos (v. *fusca*) .	160	51	8	28	11	21	17–16	?	9–8	2	1
„ „ . . .	133	52	8	27	10	20	19	29	10–9	2	1
„ Crete . . .	125	56	6	27	9	18	15	30	7–4	2	1
♀ „	115	56	8	29	8	20	15–16	28	10–5	2	1
Yg. „	65	54	6	30	9	20	15–16	29	7–8	2	1
„ „	54	57	6	28	10	21	17–16	28	10–7	2	1
„ „	53	57	6	31	10	19	16–17	28	7	2	1
„ „	47	52	8	29	8	20	17–19	28	12–10	2	1
„ „	46	58	6	30	9	21	18	27	9	2	1
„ „	46	57	6	29	9	21	18–17	27	7	2	1
„ „	45	57	6	29	9	19	16–15	28	11–10	2	1
„ „	40	58	8	27	10	19	17–18	27	9	2	1
♀ Syra	107	50	6	29	7	20	19–17	30	11–10	2	1
♂ Asia Minor . .	113	51	8	29	13	20	17–16	28	12	2	1
Yg., Smyrna . .	58	52	8	27	9	19	16–17	29	13	1	1
♂ Zebil Bulgar Dagh .	155	50	6	28	10	25	18–17	?	10–11	2	1

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
♂ Rhodes	125	50	8	28	10	22	16	27	11–12	2	1
„ „ . . .	105	57	8	29	10	22	20–19	30	12	2	1
„ N.W. of Ispahan .	126	51	8	28	10	23	16–15	29	7–8	2	1
„ „ .	123	52	6	27	11	22	14–13	27	8–7	2	1

Columns as in the preceding tables.

The young at birth measures 37 millim. from snout to vent, tail 65.

Habitat.—The range of the var. *major* extends from Dalmatia to Greece, the Ionian Islands, the Archipelago, Asia Minor, and N.W. Persia. Whether the specimens from Roumania (Dobrudja) referred to it by Kiritzescu, Bul. Soc. Sc. Bucur., x, 1901, p. 305, do not belong rather to the var. *strigata*, I cannot tell for certain in the absence of a detailed description; but the fact that the Bulgarian form pertains to the latter has induced me to refer Kiritzescu's var. *major* to the synonymy of the var. *strigata*.

Var. WOOSNAMI.

Lacerta viridis, var. *strigata* (non Eichw.), Bouleng. Journ. Linn. Soc. xxvii, 1899, p. 378; Werner. Zool. Jahrb., Syst. xix, 1903, p. 341.

Lacerta viridis, var. *woosnami*, Bouleng. Ann. & Mag. N. H. (8) xix, 1917, p. 277, figs.

The head is comparatively short, though not more so than in many specimens of the typical form, its width, in adult males, being contained $1\frac{2}{5}$ to $1\frac{1}{2}$ times in its length. Occipital $\frac{1}{3}$ to $\frac{3}{4}$ the length of the interparietal, not or but slightly broader than the latter. 2 to 8 granular scales between the supraoculars and the superciliaries. Rostral just touching the nostril; second loreal not or but slightly in contact with the second upper labial. Temple with 12 to 20 shields,* with a large or very large masseteric, which, in two specimens, extends from the upper temporal to the upper labials; the tympanic is well developed and, with one exception, in contact with the upper temporal.

Dorsal scales rhombic and strongly keeled, considerably larger than the laterals, the lower of which are smooth or faintly keeled; 38 to 43 scales across the middle of the body; 20 to 26 transverse series, in the middle of the back, correspond to the length of the head. Ventral plates in 6 longitudinal and 24 to 28 transverse series (24 to 27 in males, 27 or 28 in females). 17 to 20 femoral pores on each side. 25 to 27 lamellar scales under the fourth toe. Upper caudal scales

* Or as few as 9 according to Werner.

obtusely pointed, not more so than in many specimens of *L. muralis*; 34 to 38 scales in the fourth or fifth whorl behind the postanal granules.

Green or olive-grey above, uniform or with small black spots, sparsely scattered on the back, more crowded on the sides; in one of the adult females the black dots form a regular vertebral series or interrupted line, a type of markings which I have not met with in any other form of *L. viridis*; upper surface of head uniform green, olive, or brown. Lower parts yellow, greenish, but not blue, on the throat and on the sides of the belly. Young brown or olive with three white longitudinal streaks on the back, traces of which may be preserved in the adult; black spots may be present between them; a white streak on each side of the neck, from the middle of the tympanum, continued on each side of the body to above the hind limb, or breaking up into a series of round spots above the fore limb; another white line along each side of the belly.

Measurements (in millimetres):

	♂	♀
From end of snout to vent	102	95
,, ,, fore limb	40	35
Head	26	21
Width of head	18	13
Depth of head	15	13
Fore limb	35	32
Hind limb	57	52
Foot	30	26
Tail	190	207

Particulars of the Specimens Examined, from the South Coast of the Caspian Sea, Collected by the late Mr. R. B. Woosnam.

	1.	2.	3.	4.	5.	6.	7.	8.
♂	105	42	26	11	21	20 19	25	7 5
,,	102	42	26	11	17	17 18	27	6
,,	100	41	27	9	18	20–19	27	4
,,	81	39	25	10	16	19 20	25	2 3
,,	70	40	24	10	18	19–20	25	7–5
♀	95	40	28	11	20	19	26	4–3
,,	92	42	28	9	18	18–17	26	7
,,	59	43	27	10	19	19–20	27	4

1. Length from snout to vent (in millim.). 2. Scales across body. 3. Transverse rows of ventrals. 4. Collar plates. 5. Gular scales. 6. Femoral pores. 7. Lamellæ under fourth toe. 8. Superciliary granules.

A further specimen, a very young from Bash Nurashin, N.W. Persia (R. T. Günther), has 38 scales across the body, and 17 femoral pores on each side.

This form connects the var. *strigata* with the typical *L. viridis*, and especially the oriental specimens on which the name var. *vaillanti* has been bestowed, agreeing with the latter in the temporal scutellation and the reduction in the number of superciliary granules, with the former in the presence of a light vertebral streak in the young; it differs from both in the lepidosis of the body, with respect to which it approaches *L. princeps*. A further peculiarity of this variety as compared to the typical form resides in the low number of transverse rows of ventral plates; but the variation in the var. *strigata* shows that much importance should not be attached to it.

Var. SCHREIBERI.

Lacerta agilis, vars. b, c, Schreib. Herp. Eur. p. 434 (1875).

Lacerta schreiberi, Bedriaga, Arch. f. Nat. 1878, p. 299, pl. x, fig. 3, and 1879, pl. xviii, fig. 2; Seoane, Ident. de Lac. Schreiberi y L. Gadovii (1885); Schreib. Herp. Eur., ed. 2, p. 486 (1912).

Lacerta viridis, Boettg. Zeitschr. Ges. Naturw. (3) iv, 1879, p. 505.

Lacerta viridis, var. *gadovii*, Bouleng. Proc. Zool. Soc. 1884, p. 433, pl. xxxviii; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 74, and Amph. Rept. Portug. p. 48 (1889).

Lacerta viridis, var. *schreiberi*, Bedriaga, Abh. Senck. Ges. t.c. p. 76; Bouleng. Cat. Liz. iii, p. 15 (1887), and Bol. Soc. Espan. H. N. xix, 1919, p. 62.

Lacerta viridis, var. *ventrimaculata*, Dürigen, Deutschl. Amph. Rept. p. 127 (1897).

This is the most distinct of the varieties of *L. viridis*. It has many points, both of structure and of coloration, in common with *L. agilis*, and it is not surprising that it should have been referred to that species at a time when a close study of the scaling was generally neglected. It bears also some resemblance to *L. ocellata*, and I was at first inclined to regard it as an annectant form between *L. viridis* and *L. ocellata*, var. *pater*; Bedriaga went even so far as to pronounce it the European representative of *L. pater*. I now believe its undeniable approximation to *L. ocellata* to be explainable as a case of convergence —convergence of the lines of evolution from a common stock—as its resemblance to *L. agilis* points to a direct derivation from that species.

The principal points of resemblance with *L. agilis* reside in the

short head, amounting to absolute identity in some cases, the shorter limbs and tail, the low number of femoral pores, the frequent presence of a dark dorsal band and of four or five series of light spots on the sides in the young, and the black dots which are so frequently present on the lower parts. On the other hand we must not overlook the fact that the proportions of *L. viridis* vary very considerably; and as *L. schreiberi* agrees essentially in its lepidosis with *L. viridis*, with which it is completely connected, I do not hesitate to place it in the system as a variety of that species, close to the var. *strigata*, regarding both as directly derived from *L. agilis*.*

The head is $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad (pileus $1\frac{3}{4}$ to 2 times), and is contained $3\frac{1}{2}$ to 4 times in the length to vent in males, 4 to $4\frac{2}{3}$ times in females. The hind limb reaches the elbow or the axil in males, the wrist or the elbow in females; foot as long as the head or a little longer (not more than $\frac{1}{4}$). Tail $1\frac{3}{5}$ to 2 times length of head and body.

The rostral just touches or enters the nostril; the frontal is sometimes very short, not longer than broad and shorter than its distance from the nasals, occasionally trilobate in front; the occipital is variable but usually larger than in the typical form, sometimes as long and twice as broad as the interparietal; the granules between the supraoculars and the superciliaries form an incomplete series, 2 to 8, or may be entirely absent; the second loreal is rarely in contact with the second upper labial; the subocular is often not or but little narrower beneath than above; the second upper temporal is often broken up into two or three shields; the temporal shields are very variable, 18 to 39 in number, usually 21 to 30; a masseteric disc is usually distinct and small, sometimes large, sometimes absent; no tympanic shield, with one exception.† Instead of the third chin-shield forming a long suture with its fellow, as in the other forms of *L. viridis*, these shields are often separated from each other by granular scales or form but a short suture, thus agreeing with the typical *L. ocellata*, in which this feature is of frequent occurrence.

The following anomalies in the head-shields deserve notice. An azygos prefrontal is present in 25 per cent. of the specimens examined. In two specimens‡ the interparietal is fused with the occipital, in two others§ an additional shield is intercalated between

* Should any critic object to this suggestion on the ground of the wide geographical separation of the habitats of these two varieties I must refer him to the distribution of the genera *Blanus*, *Pelobates*, and *Pelodytes*.

† Young from the Serra de Gerez, in which it is well developed.

‡ Monchique, types of var. *gadovii*.

§ Galicia and Serra de Gerez, females.

them. In one case* the frontonasal is in contact with the frontal, and in another† it is much reduced in size, not broader than the internarial space, and does not touch the upper postnasal, a small shield separating it from the anterior loreal, a state of things frequent in *L. agilis*; in three other specimens‡ the upper postnasal is also excluded from contact with the frontonasal. 5 anterior upper labials on both sides in two specimens,§ on one side in a third.‖

19 to 27 scales in a straight line between the symphysis of the chin-shields and the median collar-plate. 10 to 13 collar-plates. Scales oval or oval-hexagonal on the back, often less strongly keeled than in the typical form, usually larger on the sides, the keels gradually disappearing towards the belly; 48 to 58 scales across the middle of the body, 29 (♀) to 35 (♂) transverse series, in the middle of the back, corresponding to the length of the head. Ventral plates in 8 longitudinal and 27 to 33 (27–31 in ♂, 30–33 in ♀) transverse series; the outer plates as large as or narrower than those of the series next to them, often bordered on the outer side by smaller plates forming an interrupted series. Preanal plate often rather small, bordered by two series of small plates.

11 to 18 femoral pores on each side, usually 13 to 15. 22 to 26 lamellar scales under the fourth toe. 36 to 44 caudal scales in the fourth or fifth whorl.

Young brown or brownish, uniform or darker on the vertebral region and on the sides, with three to five longitudinal series of large yellow or bluish white black-edged ocelli on each side, the lowest extending on the outer ventral plates, the upper or dorso-lateral (superciliary) series very regular and formed of 11 to 13 ocelli; the lateral series are less regular, and some of the spots may fuse to form vertical bars¶; the upper lip and the temple with black and white or yellow vertical bars; lower parts uniform yellowish or greenish white; tail often golden yellow or orange at least in its distal half.

This coloration persists in some adult females, with the addition of a few scattered black spots on the back, whilst other females lose the ocelli more or less completely and bear large round or irregular black spots, which may form two series along the middle of the back or may

* Female from Burbia.

† Female from Coimbra.

‡ Male and young from Galicia.

§ Serra de Gerez and Galicia.

‖ Serra de Gerez.

¶ An approach to this state of things occurs in some young of the var. *strigata*.

be very crowded, though usually leaving an unspotted area along each side of the back. Large black spots may also be present on the upper surface of the head—a style of markings which does not occur in any of the other forms of *L. viridis*. Some females are green on the anterior part or the whole of the body, but the upper surface of the head and tail are always olive or brown, the tail often with one or three dark longitudinal streaks. Males are green on the back and sides, sometimes with three broad brown longitudinal bands, closely spotted, marbled, or speckled with black on the head and body, half-grown specimens occasionally retaining in addition the ocellar markings of the young; the sides of the head and the throat are blue or bluish, and this colour is sometimes also shown by females. The lower parts are yellow, profusely or scantily spotted or dotted with black in the males, uniform or with scattered black dots in the females, these spots resembling those usually found in *L. agilis*.*

Measurements (in millimetres):

	1.	2.	3.	4.
From end of snout to vent	106	97	103	86
„ „ „ fore limb	42	33	36	31
Length of head	27	24	24	20
Width of head	20	15	16	13
Depth of head	17	13	12	12
Fore limb	37	32	37	31
Hind limb	52	45	49	42
Foot	28	24	26	24
Tail	180	170	190	135

1. ♂, Lozoya Valley. 2. ♂, Corunna. 3. ♀, Burbia. 4. ♀, Coimbra.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♂ Burbia, Leon	105	53	29	12	21	12–11	24	4	2	1
♀ „ „	107	56	32	13	25	14–15	23	4–3	2	1
„ „ „	103	57	30	10	23	14	24	3	2	1
♂ Corunna	97	51	29	11	19	12–14	24	7	2	1
„ „	90	53	31	12	27	18–16	25	3–5	2	1
„ Galicia	95	56	29	11	22	15–16	23	3–4	2	2–1
„ „	90	51	29	12	21	14–13	26	2–4	2	1–2
„ „ **P.M.**	76	52	29	11	24	14–13	23	2	2	1
♀ „	106	54	32	12	23	13–15	24	5–2	2	1
„ „	104	52	32	13	24	14	23	3–4	2	1
„ „	102	49	33	11	26	14–13	24	5	2	1

* Black dots occasionally also in males of the typical form and of the var. *strigata*.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♀ Galicia, **P.M.** . . .	95	48	33	12	23	14	24	5–4	2	1
♂ Lozoya Valley, near Madrid	112	50	30	11	24	14–13	23	8	2	1
,, ,, ,, ,,	106	49	29	10	20	16–14	24	5	2	1
,, ,, ,, ,,	106	48	30	13	24	12	22	3–4	2	1
,, ,, ,, ,,	103	53	29	11	21	14	25	8	2	1
,, ,, ,, ,,	90	48	28	10	22	14–13	22	6–5	2	1
,, ,, ,, ,,	89	48	29	11	22	13	23	4	2	1
,, ,, ,, ,,	86	52	30	11	25	15–14	24	6–7	2	1
♀ ,, ,, ,,	88	51	32	13	22	14–15	22	6–5	2	1
,, ,, ,, ,,	71	54	31	11	23	14–13	22	7–6	2	1
,, La Granja, S. of Guadarrema	98	50	33	10	26	13–14	22	4–3	2	1
,, Coimbra	86	58	32	12	26	15–13	22	0	2	2
♂ S. de Gerez	105	53	29	11	24	13	22	2–4	2	1
♀ ,, ...	112	58	31	11	23	14	24	4–6	2	1
,, ,, ...	99	55	31	10	23	13–15	25	2	2	1
,, ,, ...	85	53	30	12	24	13–14	25	7–8	2	1
♂ Monchique, Algarve (type of var. *gadovii*)	92	53	27	10	23	15–14	26	4–6	2	1
,, ,, ,,	78	53	29	11	23	14	26	2–4	2	1
♀ ,, ,,	95	50	32	11	22	13	26	4	2	1

1. Length from snout to vent (in millim.). 2. Scales across middle of body. 3. Transverse series of ventral plates. 4. Plates in collar. 5. Gular scales in a straight line. 6. Femoral pores. 7. Subdigital lamellæ under fourth toe. 8. Granules between supraoculars and superciliaries. 9. Postnasals. 10. Anterior loreals.

Habitat.—The range of this form is confined to the hilly or mountainous districts of the Spanish Peninsula, up to an altitude of 1000 metres. It is known with certainty from the Asturias, Galicia, Leon, New Castille, and Portugal. The localities given by Boscá for *L. viridis* in Seville, Vascongadas, and Old Castille, probably apply to it.

The following synopsis will help in the identification of the 5 forms :—

Forma typica. 40 to 55 scales across middle of body, usually 42 to 50; ventral plates in 6 longitudinal series, very rarely 8; occipital very rarely broader than interparietal; granules between the supraoculars and the superciliaries often absent or much reduced; tympanic shield often absent; young without light vertebral streak.

Var. *strigata*, Eichw. 38 to 49 scales across middle of body; ventral plates in 6 or 8 longitudinal series; occipital very rarely broader than the interparietal; usually a series of granules between the supraoculars and the superciliaries; tympanic shield present; young with a light vertebral streak.

Var. *major*, Blgr. 50 to 58 scales across middle of body; ventral

plates usually in 8 longitudinal series; occipital usually broader than the interparietal; a series of granules between the supraoculars and the superciliaries; tympanic shield present; temporal scales comparatively small; young usually with a light vertebral streak.

Var. *woosnami*, Blgr. 38 to 43 scales across middle of the body, dorsals considerably larger than laterals; ventral plates in 6 longitudinal series; occipital not or but slightly broader than the interparietal; a series of granules between the supraoculars and the superciliaries; tympanic shield present; young with a light vertebral streak.

Var. *schreiberi*, Bedr. 48 to 58 scales across middle of body; ventral plates in 8 longitudinal series; occipital usually broader than the interparietal; granules between the supraoculars and the superciliaries often absent or much reduced; tympanic shield absent; young without light streaks, with large round light spots on the sides.

4. LACERTA PRINCEPS.

Lacerta princeps, Blanf. Ann. & Mag. N. H. (4) xiv, 1874, p. 31, and Zool. E. Persia, p. 364, pl. xxiv (1876); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 123; Bouleng. Cat. Liz. iii, p. 18 (1887); Méhely, Zool. Anz. xxxv, 1910, p. 594.

The following description is taken from an adult female from near Shiraz in the British Museum, which agrees very closely with the type and unique specimen, likewise a female, described by Blanford and preserved in the Calcutta Museum. Foot-notes will indicate the few points in which this specimen does not quite agree with the type.

Proportions and shape of head as in *L. viridis typica*. Length of head nearly $4\frac{1}{2}$ times in length to vent; pileus $2\frac{1}{3}$ times as long as broad. Hind limb not quite reaching the axil; foot once and $\frac{1}{4}$ length of head. Tail a little less* than twice length of head and body.

Nostril pierced between 5 shields. Rostral largely entering the nostril; nasals forming a short suture behind the rostral; frontonasal broader than long, between 8 shields; prefrontals forming a moderately long median suture; frontal hexagonal, with straight parallel sides, with a median groove, nearly twice as long as broad, as long as its distance from the end of the snout, broader than the supraoculars, of which the first is very small and in contact with the second loreal, the second a little longer than the third, the fourth smaller but nearly as long as the third; superciliaries 5–6, first longest and forming a very oblique suture with the second; 4–3 granules between the supraoculars and the superciliaries; parietals nearly twice as long as broad,

* A little more in the type.

outer border convex; occipital $\frac{2}{3}$ the length of the interparietal, and a little broader.*

Two regularly superposed postnasals; anterior loreal (divided into two on the left side) half as long as the second. 4 upper labials anterior to the subocular, which is much narrower beneath than above. Two large upper temporals in contact with the parietal, first longer than second; temple covered with rather large and irregular shields (numbering 21–23), the masseteric and tympanic distinct, the latter separated from the second upper temporal by one small shield.

Pterygoids toothed.

20 gular scales in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold distinct. Collar strongly serrated, composed of 9 plates.†

Scales granular and smooth on the nape, much larger, rhomboidal, strongly and diagonally keeled, and subimbricate on the back, smaller and smooth on the sides; 37 scales across the middle of the body‡; 2 or 3 lateral scales correspond to a ventral plate, 19 transverse series, in the middle of the back, to the length of the head. Ventral plates overlapping, as in *L. viridis*, in 10 longitudinal and 31 transverse series; the plates of the second series from the median line broadest, those of the 3rd and 4th series equal, those of the 5th very small. Preanal plate broad, as long as its distance from the femoral pores, bordered by two semicircles of small plates, of which there are six in the inner, the median pair enlarged.

Scales on upper surface of tibia much smaller than dorsals and feebly keeled.§ 26 lamellar scales under the fourth toe. Femoral pores 13–15.‖

Caudal scales forming whorls of equal length, the upper with strong straight keel, ending in a point, the laterals very oblique, the lower strongly keeled; 34 scales in the fourth whorl.

The coloration is thus described by Blanford: "Olivaceous grey above, whitish below; there are a few small black spots on the back and sides of the neck, and a row of three or four blue ocelli (those in front double) with black margins behind each shoulder, extending in a line for a short distance down each side; the sides of the head are bluish, a tint especially marked on the labials; throat yellow."

* Blanford's figure represents the occipital as as long as and much broader than the interparietal, as broad as the frontal.

† 7 according to Blanford.

‡ 34 according to Blanford.

§ "Limbs covered with smooth scales," Blanford.

‖ 14 in the type.

The specimen in the British Museum differs in being of a pale brownish grey above, without spots on the neck; there are three ocellar spots on each side, the first and second with two superposed blue centres; posterior two thirds of tail reddish.

Measurements (in millimetres):

From end of snout to vent	133
,, ,, ,, fore limb	45
Length of head	30
Width of head	19
Depth of head	17
Fore limb	45
Hind limb	69
Foot	38
Tail	250

The type was obtained near Niriz, about 100 miles east of Shiraz, S. Persia, at an elevation of about 2000 m., and is preserved in the Calcutta Museum. It remained the only known specimen until a second, from near Shiraz, was presented to the British Museum by Mr. H. F. Witherby. A young specimen, measuring 50 millim. from snout to vent, from Sarchun, preserved in the Petrograd Museum, has since been described by Méhely. The head of this specimen is of course shorter and the hind limb reaches the collar; frontal narrower and with concave sides; granules between the supraoculars and the superciliaries 6–4; occipital as broad as but much shorter than the large interparietal; femoral pores 15–16. Upper parts with small black spots, irregularly scattered. It is possible that a female specimen from Angora, noticed by Steindachner (Denkschr. Ak. Wien, lxiv, 1897, p. 696) under the name of *L. viridis*, belongs to this species, in which case its range would extend to Asia Minor. Dorsal scales remarkably large, those on the sides distinctly smaller; 38 scales across the body; 11 femoral pores on each side; pale blue above (in spirit).

As recognized by Bedriaga, *L. princeps* is more nearly related to *L. viridis* than to any other species.

5. LACERTA OCELLATA.

FORMA TYPICA.

Lacerta viridis, part., Lacep. Hist. Nat. Quadr. Ov. i, p. 309, pl. xx (1788).

Lacerta ocellata, Daud. Hist. Rept. iii, p. 125, pl. xxxii (1802); M.-Edw. Ann. Sc. Nat. xvi, 1829, pp. 63, 82; Dugès, t.c. p. 368,

pl. xv ; Bonap. Icon. Faun. Ital., Amf. (1836) ; Duvernoy, Règne An., Rept. pl. xii (1836) ; Dum. & Bibr. Erp. Gén. v, p. 218 (1839) ; Gray, Cat. Liz. p. 30 (1845) ; De Betta, Faun. d'Ital., Rett. Anf. p. 26 (1875) ; Schreib. Herp. Eur. p. 423 (1875) ; Lataste, Herp. Gir. p. 65, pl. vii, figs. 1, 2 (1876) ; Bedriaga, Arch. f. Nat. 1879, p. 316 ; Camerano, Mon. Saur. Ital. p. 79, pl. ii, fig. 1 (1885) ; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 39 ; Bouleng. Cat. Liz. iii, p. 12 (1887) Bedriaga, Amph. Rept. Portug. p. 45 (1889) ; Bouleng. Tr. Zool. Soc. xiii, 1891, p. 123, pl. xv, fig. f ; Lehrs, Zool. Jahrb., Syst. xxviii, 1909, p. 83, pl. ii, figs. 1, 2 ; Schreib. Herp. Eur., ed. 2, p. 502 (1912).

Lacerta jamaicensis, Daud. t.c. p. 149.

Lacerta lepida, Daud. t.c. p. 204, pl. xxxvii, fig. 1.

Lacerta occitanica, Hermann, Obs. Zool. p. 257 (1804).

Lacerta margaritata, Schinz, Nat. Rept. p. 99, pl. xxxvii (1833).

Thimon ocellatus, Tschudi, Isis, 1836, p. 551.

Lacerta senegalensis, Gray, Ann. N. H. ii, 1838, p. 279.

Lacerta ocellata, var. *iberica*, Seoane, Ident. de Lacerta Schreiberi, etc., p. 8 (1885).

Habit stout, massive, especially in males. Head flat above in the adult, $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as broad, its depth equal to the distance between the anterior corner or the centre of the eye and the tympanum, its length $3\frac{2}{5}$ to 4 times in length to vent in males, 4 to $4\frac{2}{3}$ times in females ; snout obtusely pointed, as long as the postorbital part of the head or less (down to $\frac{2}{3}$ in full-grown males) ; an angular ridge on each side of the postorbital part of the pileus, formed by a keel on the upper temporal shields ; cheeks much swollen in the males ; pileus $1\frac{2}{3}$ to 2 times as long as broad, uneven and rugose in the adult.* Neck narrower than the head. The hind limb reaches the elbow, the axil, or the shoulder in males, the wrist or the elbow in females ; foot as long as or a little shorter than the head, rarely a little longer ; toes very feebly compressed. Tail cylindrical, gradually tapering, $1\frac{1}{2}$ to slightly over 2 times as long as head and body.

Nostril pierced between 5 shields ; rostral largely entering the nostril ; suture between the nasals short or very short ; frontonasal as long as broad or a little longer or a little shorter than broad, usually broader than the internarial space, nearly always in contact with the upper postnasal ; prefrontals forming an extensive median suture† ; frontal as long as or shorter than its distance from the end

* In half-grown specimens the shields are marked with concentric striæ, similar to those on the carapace of tortoises, as observed by Lataste in the typical form and by Werner in the var. *pater*.

† Separated by a small shield in a male from Cacabelos.

of the snout, $\frac{1}{5}$ to $\frac{1}{4}$ the length of the pileus, $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, as broad as or broader than the supraocular region, trilobate in front in adult males; frontoparietals usually longer than the frontal; parietals $1\frac{1}{2}$ to 2 times as long as broad; interparietal narrow, as long as or shorter* than the occipital, which is large or very large, as long as broad or broader than long, and usually broader than the frontal,† sometimes just as broad or a little narrower, sometimes longitudinally divided into two or separated from the interparietal by a small shield, rarely broken up into several irregular shields. This description of the upper head-shields applies to adult specimens. The young differ more considerably than in other species of *Lacerta*; the frontonasal is always broader than long; the prefrontals form a short median suture; the frontal is much narrower than the supraocular region and twice as long as broad, its length only 3 to $3\frac{1}{2}$ times in the length of the pileus; the frontoparietals are shorter than the frontal and not larger than the interparietal; the occipital is shorter than the interparietal and about twice as broad as long‡; the upper temporals are devoid of a keel.

Four supraoculars, first small or very small, in contact with the second loreal, second and third large, fourth small but larger than the first, rarely divided into two, and nearly always forming a suture with the first upper temporal; 5 or 6, exceptionally 7, superciliaries, first longest; a complete or incomplete series of granules, sometimes reduced to 5, between the supraoculars and the superciliaries. Two superposed postnasals, the upper nearly always in contact with the prefrontal§; anterior loreal $1\frac{1}{2}$ to 2 times as deep as long,‖ much shorter than the second,¶ sometimes in contact with the frontonasal**;

* A little longer in a male from Silos.

† I have never seen the occipital of such enormous dimensions (fully twice as broad as the frontal), as figured by Schreiber (op. cit.).

‡ Bedriaga states that the occipital is divided into 5 or 7 shields in the very young, and he supposes that these fuse into one as the lizard grows. He must have based his statement on abnormal specimens, for the very young examined by me have the shield entire, with the exception of one from Silos in which it is divided into three, as may be found in the adult. Other examples of abnormal division have been figured by Dugès.

§ Separated from it by a small shield in a male from Valdeblore, and in another from Madrid (Paris Museum).

‖ Absent in a male from Montpellier, on one side in a female from Antibes. Two superposed shields in a male from Nice.

¶ Which is divided into two by a horizontal suture in a male from Villa Franca and in a male and a young from Silos.

** In a half-grown specimen from Arlac, two small shields separate the upper postnasal and the anterior loreal from the frontonasal.

4 upper labials* anterior to the subocular, the lower border of which is $\frac{1}{2}$ to $\frac{2}{3}$ the length of the upper. Two large upper temporals; temple covered with rather small or moderately large shields, 30 to 50 in number, among which a feebly enlarged masseteric may often be distinguished; tympanic shield small or absent.

Pterygoids constantly toothed, the teeth in 2 or 3 longitudinal series.

6, rarely 5 or 7, pairs of chin-shields, the 2 or 3 anterior in contact in the middle†; 26 to 39, usually 29 to 35, gular scales in a straight line beween the symphysis of the chin-shields and the median collar-plate; gular fold absent or feebly marked. Collar strongly serrated, formed of 9 to 14 plates, usually 10 to 13.

Scales granular, as long as broad or a little longer than broad, smooth, or faintly keeled on the posterior half of the body; 63 to 80 scales across the middle of the body, usually 66 to 75; 3 or 4 lateral scales correspond to a ventral plate; 40 (females) to 62 (males) transverse series of scales, in the middle of the back, correspond to the length of the head. Ventral plates overlapping, the edge of the transverse series broken by more or less distinct notches between the plates, in 8 or 10 longitudinal series; the plates of the inner series from the median line usually narrower than the 2 or 3 next to it, which are $1\frac{1}{2}$ to 2 times as broad as long, the fourth and fifth sometimes equal in size; 28 to 34 transverse series (28 to 32 in males, 31 to 34 in females). Preanal plate sometimes rather large, sometimes rather small, sometimes longitudinally divided into two,‡ bordered by 2 or 3 semicircles of small plates.

Scales on upper surface of tibia as large as dorsals or a little larger, smooth or feebly keeled. 11 to 15, rarely 16, femoral pores on each side. 21 to 26, usually 22 to 25, lamellar scales under the fourth toe, divided except the distal, bearing rather strong tubercles in the young.

Caudal scales forming whorls of equal or nearly equal length, the upper with strong straight keel, ending in a point which may be very obtuse; lower scales rounded or truncate behind, feebly keeled in the adult, smooth in the basal whorls; 40 to 48 scales in the fourth or fifth whorl; sensory apical pits often present.

Young olive-brown to green above,§ neck, body, limbs, and base of tail with numerous black-edged ocelli which are usually arranged in

* 3 in a male from Silos.

† 2 in about 25 per cent. of the specimens examined.

‡ In two specimens from Cannes.

§ Grey or brown, never green, at birth, with the centres of the ocelli white.

transverse rather than in longitudinal series; these ocelli, 10, 12, or 14 in number in a transverse series on the body, are yellow on the back and bluish on the sides, and the black rings may be enlarged and run together to form transverse chains, or even irregular or oblique cross-bars. Head brown or olive above and on the sides, with round yellowish spots on the sides, one on each upper labial shield. Digits and tail often reddish. Lower parts greenish white.

As the lizard grows, the ground colour turns either to a brighter green or to brown or even reddish-brown, the ocelli on the back and limbs lose the bright colour or become transformed into rosettes with a black central spot or into a network, whilst the centres of the lateral ocelli become enlarged and form 2 to 4 longitudinal series of large deep-blue spots, with or without narrow black edges, sharply defined from the ground colour and usually larger in males than in females. Sometimes the upper parts appear blackish-purple or black, closely sprinkled with yellow or green, with more or less distinct traces of the reticular or ocellar pattern, which is usually so suggestive of an embroidery. Head, and sometimes also the nape, brown or blackish above. Tail olive or brown, often reddish posteriorly, with small dark spots which may form regular annuli. Lower parts yellowish, greenish white, or bluish green.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.	8.	9.
From end of snout to vent .	210	180	180	165	160	195	140	118	107
„ „ „ fore limb	84	65	75	68	63	64	53	45	43
Head	66	45	49	45	43	43	32	28	26
Width of head . . .	44	32	34	32	31	31	23	20	18
Depth of head	34	29	26	25	24	22	19	14	13
Fore limb	68	59	58	54	54	61	44	39	38
Hind limb	103	84	89	80	90	93	66	58	58
Foot	50	43	40	38	45	48	33	29	33
Tail	400	315	310	290	320	—	215	180	220

1. ♂, Nice. 2. ♂, Provence (type). 3. ♂, Madrid. 8. ♂, Silos. 5. ♂, Gibraltar. 6. ♀, Antibes. 7. ♀, Valencia. 8. Hgr., Arlac. 9. Hgr., Ciudad Real.

Particulars of Specimens Examined.

France:	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♂ Valdeblore, Alpes-Maritimes, 1140 m.	180	74	10	31	11	36	13	22	6·5	9
♀ Antibes	190	75	10	31	12	36	12	25	6·5	11
♂ Cannes	130	75	10	30	10	32	12–13	23	5·5	9
„ „	130	78	10	30	11	37	13–14	23	6	9
♂ Nice	210	71	10	30	11	35	12–13	23	9	14

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♂ Nice	210	69	10	30	10	33	13	26	8	15
„ „	172	68	8	31	10	35	12-11	23	7	12
♂ Provence (type) **P.M.**	180	70	12	34	10	31	12-13	25	7	9
♀ Marseilles	170	78	10	33	14	35	13	25	6	9
Yg. „	44	72	8	32	12	31	13-12	21	2·5	4
♀ Ste. Cécile, Vaucluse	175	66	10	33	14	31	13-12	23	6	6
♂ Montpellier	140	71	10	29	13	31	11-14	23	5	8
♀ „ **P.M.**	130	74	10	30	11	37	13	25	5	8
Yg., C. Cerbère, Pyrén. Orient.	50	69	10	29	12	34	13-12	24	2·5	4
„ „ „	47	73	10	30	13	34	13-14	25	2·5	4
Hgr., Arlac, Gironde	118	69	10	32	10	33	12	23	4	6
Yg. „ „	82	73	10	30	12	31	13-14	21	3	5
♂ Oléron Id.	193	71	10	31	12	35	12-11	22	8	11
„ „	150	75	10	32	13	31	11-12	21	6·5	10
Spain:										
♂ Ferrol, Galicia	135	79	10	32	11	39	12-14	25	5	5
♀ Galicia	160	74	10	32	11	31	12-11	22	5	4
♂ Villa Franca, Leon	170	70	10	30	12	31	15-14	24	6·5	7
„ Cacabelos „	152	73	10	32	12	34	14-13	24	6	8
„ Silos, nr. Burgos	165	68	8-10	30	11	34	13	22	6	6
„ „ „	142	63	10	30	12	29	12	26	5	7
„ „ „	130	67	10	32	12	33	11	24	5	6
„ „ „	140	63	10	32	12	33	12-11	21	6	8
Hgr. „ „	117	69	10	31	12	30	11	23	4·5	6
Yg. „ „	43	73	10	31	12	32	12	22	2·5	3·5
♂ Madrid	180	67	10	30	11	33	11-12	24	7	11
Hgr. „	120	71	8	33	11	37	13-12	24	4	7
♂ „ **P.M.**	187	70	8	30	12	34	13-12	25	9	12
♀ Lozoya Valley, nr. Madrid	132	75	8	32	13	33	12	24	5	7
Hgr. „ „	107	74	10	30	10	36	13	24	4	5
Yg. „ „	67	65	10	34	11	35	12	23	3	3
„ „ „	58	66	10	31	14	30	12-13	26	3	4
Hgr. Ciudad Real	107	70	8	32	12	34	11	23	4	5
Yg. „	57	78	10	30	12	33	12-11	23	3	4
„ „	62	80	8	32	10	35	14-13	24	2·5	3·5
„ „	55	70	10	32	11	32	13	23	2·5	4
„ „	54	79	10	30	11	34	15	24	3	4
„ „	54	64	10	32	13	31	13	25	2·5	3·5
„ „	45	73	8	31	13	32	13	23	2·5	3
♀ Albufera, Valencia	140	80	8	31	13	35	15-16	24	5	5
♂ Seville	150	66	8	30	12	30	11	24	6	7
„ „	150	69	8	31	10	26	13	24	6	7
♀ „ **P.M.**	144	69	8	30	13	32	13	25	6	8
♂ Gibraltar	160	64	8	29	12	26	13	24	6	10
♀ „ **P.M.**	160	63	8	31	12	32	14	22	6	9
Portugal:										
Yg. Coimbra	95	73	8	29	13	31	13-12	25	4	5
„ „	73	69	8	29	10	30	13-14	24	3	4

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Yg. Pomerao . . .	63	66	10	30	12	32	13–14	25	3	4·5
„ „ . . .	56	72	8	29	11	29	14–15	25	3	3·5
„ „ . . .	52	72	8	29	11	35	14	22	2·5	3·5
„ „ . . .	48	70	8	30	12	33	14–13	24	2·5	3 5
„ „ . . .	48	70	8	29	11	34	14	23	2·5	3·5
♂ Cintra	145	70	10	28	10	29	11–13	23	6	6
Yg. „	63	80	8	30	11	33	14–15	25	3	4
Yg. Lisbon	53	76	10	32	11	29	11–13	24	2·5	2 5
Hgr. Alcochete . . .	103	70	8	28	11	36	14–13	24	4·5	6
♂ Low. Alemtejo . .	180	66	8	30	12	34	14	24	6	10
Yg. Salir, Algarve . .	49	71	8	29	9	36	12–11	23	2·5	2·5
„ „ „ . .	47	72	8	30	13	29	13–12	25	3	3

1. From end of snout to vent (in millimetres). 2. Scales across middle of body. 3. Longitudinal series of ventral plates. 4. Transverse series of ventral plates. 5. Plates in collar. 6. Gular scales in median longitudinal series. 7. Femoral pores (right and left). 8. Lamellæ under fourth toe. 9. Width of frontal shield. 10. Width of occipital shield (in millim.).

Habitat.—Liguria, South of France as far North as the Jura and the Charente-Inférieure, Spain and Portugal. 1140 m. is the highest altitude reached by this form in the Alps, 1000 m. in Spain.

Remains which are certainly referable to this lizard have been recorded* from a cave at Lunel-Viel, Hérault, with *Ursus spelæus* (Pleistocene). A parietal bone from La Grive St. Alban (Middle Miocene), preserved in the British Museum (*Lacerta lamandini*, Filhol?) is not distinguishable from the same bone in *L. viridis*, var. *major*, and *L. ocellata*, var. *pater*.

Var. PATER.

Lacerta ocellata, Schleg. in Wagn. Reis. Alg. iii, p. 112 (1841); Strauch, Erp. Alg. p. 33 (1862); Bouleng. Nov. Zool. xii, 1905, p. 74, pl. i, fig. 2 and pl. ii, fig. 1; Rosén, Ann. & Mag. N. H. (7) xvi, 1905, p. 138.

Lacerta ocellata pater, Lataste, Le Natural. 1880, p. 306.

Lacerta ocellata, var. *viridissima*, Boettg. Ber. Senck. Ges. 1880–81, p. 146, and in Kobelt, Reise Alg. Tun. p. 466 (1885).

Lacerta pater, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 54; J. v. Fisch. Zool. Gart. xxix, 1888, p. 265; Werner, Verh. Zool.-bot. Ges. Wien, xlii, 1892, pp. 351 and 353 and xliv, 1894, p. 79.

Lacerta ocellata, var. *pater*, Bouleng. Cat. Liz. iii, p. 13 (1887), and Tr. Zool. Soc. xiii, 1891, p. 123, pl. xv, figs. *a–e*; Doumergue, Herp. Oran. p. 117, pl. viii, figs. 1, 2 (1901); Lehrs, Zool. Jahrb., Syst. xxviii, 1909, p. 84.

* Gervais, Zool. Pal. Franç. p. 258, pl. lxiv, fig. 4 (1852).

Lacerta ocellata, var. *tangitana*, Bouleng. Cat. Liz. iii, p. 13, pl. iii, fig. 1, Ann. & Mag. N. H. (6), iii, 1889, p. 303, and Tr. Zool. Soc. xiii, 1891, p. 124, pl. xv, fig. *f*; Anders. Proc. Zool. Soc. 1892, p. 13; Doumergue, op. cit. p. 119, pl. viii, figs. 3, 4.

The North African representatives of *L. ocellata*, which are grouped together under the name of var. *pater*, and which earlier authors confounded either with the typical form or with *L. viridis*,* were first shown by Lataste to constitute an interesting connecting link between these two allied species, and, had he been acquainted with the Moroccan lizards described later as var. *tangitana* and with the var. *major* of *L. viridis*, he could have offered even more forcible arguments in favour of his proposition. As the name *pater* implies, Lataste considered this annectant form as ancestral to both *L. ocellata* and *L. viridis*, though nearer the former; in the present state of our knowledge, I think it is evident that the latter species is the more primitive and leading through its var. *major* and this var. *pater* to the typical *L. ocellata*.

This variety has since been raised by Bedriaga to the rank of a species, but I have always held Lataste to have been well advised in treating it as subordinate to *L. ocellata*, the supposed distinctive characters, even that derived from the size of the occipital shield, being absolutely unreliable. The best characters by which African specimens may be distinguished from the European reside in the frequent absence of the keel limiting the pileus on each side behind the orbit†—a character which cannot, however, be applied to young specimens—and the generally larger size of the gular scales, whatever the age of the individual.

If we compare specimens from Tangier, on which I bestowed the name var. *tangitana*, with those from Algiers and eastwards, we find that the former differ in having smaller scales (77 to 98, instead of 65 to 85, across the middle of the body) and more numerous femoral pores (17 to 22 on each side, instead of 12 to 17); but Doumergue has shown that the two supposed varieties occur promiscuously in the Province of Oran, and specimens from the Atlas of Morocco have further convinced me that the distinction cannot be upheld, the increase in the number of scales and femoral pores from east to west being too gradual, and the two characters not always going hand in hand.

The proportions‡ and the head-shields are the same as in the

* Gervais, 1836, Duméril and Bibron, 1839.

† I notice, however, exceptions in specimens from Duirat and Bona.

‡ We must bear in mind that Bedriaga was not acquainted with full-grown specimens, his largest measuring only 110 millim. from snout to vent, which accounts for his statement that the proportions are intermediate between those of *L. viridis* and of the typical *L. ocellata*.

typical form, except that the digits are as a rule a little more slender, that the tail may be $2\frac{2}{5}$ times the length of head and body, that the frontonasal is often a little broader,* the frontoparietals are not or but little longer than the frontal and the interparietal is sometimes a little longer than the occipital; special allusion must be made to the size of the occipital, which was described by Lataste as intermediate between that of *L. viridis* and that of *L. ocellata*. Leaving aside young specimens, in which the shield is shorter in proportion and sometimes twice as broad as long, the smallest occipital is found in specimens from Batna and Tangier, in which it may be a little longer than broad, scarcely larger than the interparietal, and much narrower than the frontal; in other specimens from Tunisia, Algeria, and Tangier its width may equal that of the frontal, and in those from the Atlas of Morocco it is as broad as the frontal, or narrower, or broader, as may be seen from the table on p. 108, which shows that the comparative width between the two shields may be exactly the same as in the typical form, in which, however, the occipital is larger on an average.

The first loreal is nearly always in contact with the frontonasal†; 4 or 5 superciliaries, exceptionally 3 or 6; the granules between the supraoculars and the superciliaries usually form an incomplete series and are sometimes reduced to 4 or 5‡. Exceptionally 3§ or 5‖ anterior upper labials. 28 to 55 temporal shields.

The three anterior chin-shields constantly in contact in the middle. 22 to 31 gular scales in a median longitudinal series, usually 24 to 29. 9 to 15 plates in the collar.¶

Scales round or oval-subrhombic or subhexagonal and longer than

* Sometimes longitudinally divided (several specimens from Tunis, Setif, Tlemsen, and Fenzou). 3 shields, forming a triangle, in a specimen from Duirat and in another from Algiers. In a young from Tangier it is in contact with the rostral; in another from Fenzou it is in contact with the frontal. An azygos prefrontal is sometimes present (young from Ain Drahan and Fenzou).

† In a half-grown specimen from Seksawa, and in a young from Tangier, the upper postnasal is in contact with the prefrontal, and it is so on one side in single young specimens from Seksawa, Bona and Lambesa. In a young from Tangier the lower postnasal is fused with the anterior loreal. Two superposed anterior loreals in a female and in two young from Fenzou; in a female from Batna the anterior loreal is reduced to its lower half, which forms a triangle with the two postnasals.

‡ Or even 2 or 3, according to Bedriaga.

§ On one side in a female from Fenzou.

‖ In a female from N. of Biskra, in two young from Fenzou.

¶ The young specimen from Tlemsen with 21 plates must be regarded as an individual anomaly.

broad, usually feebly keeled, sometimes smooth, 65 to 85 in specimens from Tunisia and Algeria East of Oran, 70 to 98 in specimens from Oran and Morocco* ; 40 (females) to 72 (males) transverse series in the middle of the back, correspond to the length of the head. Ventral plates in 6 or 8 longitudinal series†, the inner and the two outermost on each side as a rule narrower than the other, which is 2 to $2\frac{1}{2}$ times as broad as long ; sometimes, when only 6 series are present, the reduction may be due to the fusion of the plates of the two outer series, as is well shown by a female from Batna ; in other cases the second and third series from the median line are equal in width and the fourth is narrower than the first ; 27 to 30 transverse series in males, 28 to 33 in females.

13 to 17 femoral pores on each side, very rarely 12, in specimens from Tunisia and Algeria East of Oran, 15 to 22 in specimens from Oran and Morocco. 22 to 29 lamellar scales under the fourth toe, usually 23 to 26.

36 to 44 caudal scales in the fourth or fifth whorl.

There is a colour-dimorphism in the young. Most of them are bluish green or greyish olive above with white dark-edged ocelli forming 8 or 10 longitudinal series, never running together into transverse chains as in the typical form, sometimes with irregular black spots in addition. Others are uniform green (Bona, Guelma).

Adult olive or green, uniform or spotted, vermiculated or speckled with black, with or without the ocellar spots of the young, or with traces of them, only exceptionally with blue spots on the sides, and in males only, these spots smaller than usual in the typical form.‡ A female from Imintamout is remarkable for the interruption of the black network on the middle line of the back, thus producing the effect of a light vertebral stripe.§ Head olive or green, uniform or with small black spots. Tail olive or brown, often reddish posteriorly, frequently with rather large black spots disposed irregularly. Lower parts greenish yellow.

* 74 to 100 in specimens from the Province of Oran, according to Doumergue.

† Exceptionally 10 (2 specimens from Lambesa) according to Werner, l.c., 1892.

‡ In which they appear to be constant.—As noticed above they are exceptionally present in *L. viridis*, var. *major*. We find them again in the *Gallotia* Section.

§ I cannot help regarding this anomaly as an atavistic feature due to the derivation of this lizard from a striped form similar to *L. viridis*, var. *major*. Lehrs mentions an adult female from Bona, in the Berlin Museum, which has a light stripe along each side instead of the lowermost series of ocelli. It is to be expected that tri- or quinquestriated young of this variety will turn up some day.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.	8.
From end of snout to vent	165	157	120	108	142	160	142	100
„ „ „ fore limb	64	65	50	46	55	53	49	39
Head	44	46	31	28	34	35	32	25
Width of head	32	33	22	19	26	24	21	15
Depth of head	27	28	18	15	22	21	19	13
Fore limb	56	53	41	40	50	50	48	39
Hind limb	81	80	66	58	75	67	70	59
Foot	42	40	32	31	40	34	35	31
Tail	320	—	—	205	265	260	315	240

1. ♂, Tunis. 2. ♂, Setif (type). 3. ♂, Tangier (type of var. *tangitana*). 4. Hgr. Tlemsen. 5. ♀, Tunis. 6. ♀, Batna (type). 7. ♀, Imintamout. 8. Hgr., Seksawa.

The var. *pater* does not appear ever to attain so large a size as the typical form.

Particulars of Specimens Examined.

Tunisia:	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♂ Tunis	165	73	8	28	11	26	15–14	26	6·5	6·5
♀ „	142	76	8	29	10	25	15–16	25	5	4
„ „ **P.M.**	130	76	8	30	12	25	17–16	23	5	4
♂ Ain Drahan	136	80	8	29	11	27	17–16	27	6	6
„ „ „	130	75	8	29	11	23	15–14	25	5	4·5
♀ „ „	132	81	8	30	15	25	13–14	27	5	4
Yg. „ „	66	68	8	31	13	22	13	25	3	2
♂ Duirat	149	76	8	30	12	26	16	25	7	5
„ „	110	77	8	28	13	24	16–15	27	4	3
♀ „	155	77	8	30	11	26	13–15	26	5	4
„ „	150	71	8	30	14	28	14–15	25	5·5	4·5
„ Tunisia, **P.M.**	170	74	8	32	13	24	13–14	25	6	5
„ „ „	150	73	8	31	11	25	15–14	24	6	6
„ „ „	130	71	8	30	12	22	17–16	25	5·5	4·5
„ „ „	130	75	8	30	10	25	16	26	5	4·5
„ „ „	118	75	8	30	11	22	15	24	5	4
Algeria:										
♂ Bona, **P.M.**	138	72	8	30	13	26	15–16	25	6	5
„ „	158	82	8	29	11	30	14–15	26	6	5
♀ „	118	65	8	32	12	22	14	23	5	4·5
Hgr. „	104	76	8	32	15	29	16–14	26	4	4
Yg. „	52	71	8	28	11	27	14	25	3	3
Hgr. Guelma (type)	84	71	8	30	11	28	16	26	3·5	3·5
Yg. „ „	48	78	8	31	12	27	17	23	2·5	3
♂ Setif (type)	157	74	8	30	13	25	12–13	25	7	6
♀ „ „	150	74	8	31	12	26	13	22	6	5
Hgr. „ „	94	75	8	31	12	24	13	23	4	4

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10
Yg. Setif (type) . . .	46	85	8	30	13	26	14	25	2·5	2·5
„ Lambesa (type) . .	50	78	8	31	12	26	14	23	2·5	2·5
„ El Guerah „ . .	51	72	8	30	12	24	15	23	2·5	2·5
♀ Batna (type) . . .	160	77	6-8	31	11	27	13	24	6	4
„ „ „ . . .	148	71	8	32	10	25	15-14	26	5	3
♂ N. of Biskra* . . .	158	83	8	30	11	26	14-15	26	5	4
♀ „ . . .	124	83	8	30	11	26	14	24	5	5
Hgr. Algiers (type) . .	105	77	8	29	14	24	13-14	26	4	4
Yg. „	52	75	8	30	12	25	14-15	24	2·5	2·5
„ „	46	78	8	33	12	26	14-13	22	2·5	2·5
♀ Hammam Meskoutine .	153	75	8	31	10	26	14	23	5	4·5
♂ Algeria†	150	73	8	29	11	26	16-15	23	6	6
„ Tlemsen	140	80	8	30	9	27	17	24	5·5	4·5
„ „	145	85	8	30	14	31	18-19	27	6·5	4
„ „	143	84	8	30	14	28	17-18	26	6	5·5
♀ „	127	77	8	31	11	24	15	23	5	4
Hgr. „	108	78	8	30	12	25	16-15	23	4	4
Yg. „	47	88	8	30	21	29	18	22	2·5	2
Morocco:										
♂ Tangier (type of v. *tangitana*)	120	85	8	30	12	26	18	27	5	3·5
♀ „ „ „	132	98	8	31	11	27	18-17	28	5	4
Yg. „ „ „	75	90	8	29	10	28	18-19	29	3	3
„ „ „ „	71	96	6	30	11	27	18-19	24	3	2·5
„ „ „ „	66	84	6	30	11	29	18-20	25	3	3
„ „ „ „	47	80	8	29	11	28	18	26	2·5	2·5
♂ Tangier	150	80	6	30	12	25	18-17	24	6	6
„ „	142	88	8	29	11	29	17	24	5·5	
„ „	132	85	8	28	10	27	19-21	26	5	5
♀ „	153	77	6-8	32	10	26	19-18	25	6	5·5
Yg. „	73	84	8	29	15	27	17	27	3	3
„ „	47	80	8	32	11	25	18-19	26	2·5	2·5
„ Imintamout, Atlas . .	156	71	6-8	30	10	28	19	25	6	6
„ „ „ . .	151	75	8	29	12	29	19-17	26	6	6
„ „ „ . .	145	74	6	28	9	26	20-19	27	6	7·5
„ „ „ . .	129	70	6	28	10	25	17	27	5	4
„ „ „ . .	121	81	8	28	11	26	21-22	24	5	5
♀ „ „ . .	142	79	8	31	13	25	17-16	24	6	6
„ „ „ . .	142	79	6	28	11	24	16-17	25	5·5	6·5
„ „ „ . .	128	72	8	28	11	26	17-18	22	5	6
Yg. „ „ . .	71	75	6-8	29	9	28	19-21	26	3·5	4
♂ Fenzou, Atlas . . .	160	79	8	27	11	25	19-18	25	7	7
„ „ „ . . .	113	75	8	28	12	30	18-19	25	5	6·5
♀ „ „ . . .	137	70	8	31	11	26	17-16	23	5	5·5
Yg. „ „ . . .	82	73	8	29	10	26	19-20	28	3·5	3·5

* Tristram's "Sahara" included the greater part of the High Plateaux.

† Labelled *Chrysolamprus algirus*, a MS. name of Fitzinger's.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Yg. Fenzou, Atlas . . .	78	75	8	29	10	25	20	25	3·5	3·5
„ „ „ . . .	69	75	6	28	10	24	18–17	25	3	3
„ „ „ . . .	59	68	8	29	11	24	15–17	25	2·5	2·5
„ „ „ . . .	55	66	6–8	30	10	26	18–19	23	2·5	2·5
„ „ „ . . .	51	72	8	28	9	23	21–19	23	2·5	2·5
Hgr. Seksawa, Atlas . .	100	73	6	30	10	25	19–18	25	4	4
Yg. Tamaruth „ . .	60	77	6–8	29	10	29	19–18	26	3	3

Columns as in the preceding table.

Habitat.—Tunisia, Algeria, and Morocco, North of the Sahara; up to 1500 metres in the Atlas of Morocco.

The best combinations of characters for distinguishing the two forms of *L. ocellata* may be thus contrasted:

Forma typica.—Occipital rarely narrower than frontal, often broader; upper postnasal usually in contact with frontonasal; upper temporals, in the adult, with a keel bordering the pileus; ventral plates in 8 or 10 longitudinal series; 26 to 39 gular scales in median longitudinal series, usually 29 to 35; 63 to 80 scales across middle of body; 11 to 16 femoral pores on each side, usually 11 to 14.

Var. *pater*, Lat.—Occipital rarely broader than the frontal, often narrower; first loreal nearly always in contact with frontonasal; upper temporals usually without keel; ventral plates in 6 or 8 longitudinal series, very rarely 10; 22 to 31 gular scales in median longitudinal series, usually 24 to 29; 65 to 100 scales across middle of body; 13 to 22 femoral pores on each side, very rarely 12.

Section II. Gallotia, Blgr.—Ventral plates in 8 to 20 longitudinal series, transverse series with nearly rectilinear border; if ventrals in 8 longitudinal series, anterior border of ear denticulated; a single postnasal; 17 to 33 femoral pores; 24 to 37 lamellar scales under the fourth toe; pterygoid teeth present.

Synopsis of the Species.

A. Anterior border of ear denticulated; dorsal scales rather large, rhombic and diagonally keeled; 17 to 23 femoral pores; 24 to 30 lamellar scales under fourth toe; 4 upper labials anterior to subocular.

44 to 52 scales across middle of body; ventrals in 8 or 10 straight longitudinal and 26 to 30 transverse series; collar serrated, formed of 6 to 10 plates; parietals strongly bent down on the temple, which is granulate, without masseteric shield . . . . . *L. atlantica*, Peters & Doria, p. 111.

B. Anterior border of ear not denticulated; dorsal scales minute, granular, more or less distinctly keeled; 23 to 33 femoral pores; 29 to 37 lamellar scales under fourth toe; 5 or 6 upper labials anterior to subocular.

1. Ventrals in 10 to 14 straight longitudinal and 29 to 31 transverse series; collar not serrated, formed of 7 to 12 plates; parietals more or less bent down on the temple, which is granulate, with more or less distinct masseteric shield.

90 to 110 scales across middle of body; ventrals in 10 or 12 longitudinal series; rostral usually touching the nostril; scales covering the lower eyelid extremely small and granular, those in the centre scarcely, if at all, differentiated.
L. cæsaris, Lehrs, p. 115.

78 to 106 scales across middle of body; ventrals in 12 or 14 longitudinal series; rostral not touching the nostril.
L. galloti, D. & B., p. 118.

2. Ventrals in 16 to 20 longitudinal series, the series discontinuous or oblique, and 33 to 36 transverse series; two or three large upper temporals, first in contact with fourth supraocular; collar formed of 10 to 17 plates.

79 to 93 scales across middle of body; collar entire or feebly serrated; temple granulate, with more or less distinct masseteric shield; rostral not touching the nostril.
L. stehlini, Schenkel, p. 121.

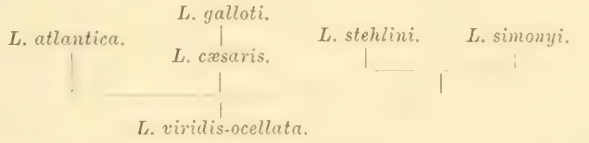
84 to 100 scales across middle of body; collar strongly serrated; temple covered with large, irregular, polygonal shields; rostral entering the nostril . . . . *L. simonyi*, Stdr., p. 124.

Were we to attach to the temporal lepidosis the same importance as claimed for it by Prof. v. Méhely in dealing with the lizards of the *L. muralis* type, we should divide the *Gallotia* section into two groups: one, including *L. atlantica*, *cæsaris*, and *galloti*, in which the parietal shield descends to the side of the temple, the other with *L. simonyi* and its close ally *L. stehlini*, in which the first upper temporal is large, extends to the upper surface of the head, and joins the fourth supraocular. It seems, indeed, that in this case, as suggested by the above-named author, the anterior upper temporal, which conforms to the *L. agilis-ocellata* type in *L. simonyi* and *stehlini*, has in the other species actually fused with the parietal—a view which derives support from the fact that, occasionally, in *L. galloti*, a short cleft is present in the parietal exactly in the position which the suture between the two shields would occupy, thus explaining why, in this species, unlike most others, the last upper temporal is large as compared to those preceding it.

From this point of view, then, *L. simonyi* is more primitive than *L. galloti*, as it undoubtedly also is in the serrated collar and the temporal lepidosis generally. On the other hand, the increased number of ventral plates and the larger size show a further departure from the hypothetical ancestral form, which I assume to have been related to *L. viridis* and *L. ocellata*, and to have possessed

a light vertebral streak, which has been retained in *L. cæsaris*. *L. atlantica*, although occupying a somewhat isolated position, has too much in common, as regards both structure and coloration, with *L. galloti* to be considered as not related to it, combining features more primitive (lower number of ventral plates and serrated collar), and more advanced (denticulation in front of the ear). It must be borne in mind that the difference in the dorsal scales between *L. atlantica* and *L. galloti* is about the same as that which separates *L. princeps* from *L. ocellata*, both of which I regard as directly derived from *L. viridis*.

It is clear therefore, that the relationships of the species of this group cannot be expressed by a linear arrangement. Their affinities seem to be as follows:



The view which I first expressed in 1891* as to the relationship of *L. galloti* and *L. simonyi* to *L. ocellata* has been supported by P. Lehrs in 1909.† A further argument in favour of the derivation of this group from *L. ocellata* is found in the presence of a single postfrontal bone, as in that species, instead of two as in *L. agilis* and *L. viridis*.‡ Whilst the two bones are distinct in young *L. ocellata*, Siebenrock has ascertained that they are fused from the earliest youth in the species which constitute the Section *Gallotia*.§ The character must be used with discretion for systematic purposes, as fusion of the two elements may take place in the adult of some of the species, *L. viridis*‖ and *L. muralis* for instance, but it is of importance, as in this case, in the attempt at tracing the derivation of forms.

6. LACERTA ATLANTICA.

Zootoca galloti, part., Gray, Cat. Liz. p. 30 (1845).

Lacerta atlantica, Peters & Doria, Ann. Mus. Genova, xviii, 1882.

* Proc. Zool. Soc. 1891, p. 201.

† Zool. Jahrb., Syst. xxviii, p. 93.

‡ Cf. Siebenrock, Sitzb. Ak. Wien, ciii, 1, 1894, p. 240.

§ Unless the skull be disarticulated, it is necessary to examine the inner side of the parietal region to make certain as to this character, which is obscured on the upper surface by the dermal incrustations.

‖ The postfrontal is single in the only skull of the var. *schreiberi* (adult male) examined.

p. 433; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 314; Boulenger, Cat. Liz. iii, p. 42 (1887); Steind. Ann. Hofmus. Wien, vi, 1891, p. 294.

Not unlike *L. jacksonii* in form and lepidosis. Head $1\frac{2}{3}$ to $1\frac{1}{2}$ times as long as broad, its depth equal to the distance from the centre of the eye to the tympanum, its length $3\frac{2}{3}$ to 4 times in length to vent in males, 4 to $4\frac{1}{3}$ times in females; snout rather pointed, as long as the distance from the eye to the tympanum. Pileus 2 to $2\frac{1}{4}$ times as long as broad. Neck as broad as or broader than the head. The hind limb reaches the axil or the shoulder in males, the elbow or the axil in females. Foot 1 to $1\frac{1}{3}$ times length of head; digits slender, compressed. Tail cylindrical, $1\frac{1}{2}$ to 2 times length of head and body.

Nostril pierced between three shields only. Suture between the nasals $\frac{1}{3}$ to $\frac{1}{2}$ length of frontonasal, which is broader than long and broader than the internarial space; prefrontals forming an extensive suture*; frontal as long as its distance from the nasals or from the rostral, $1\frac{1}{5}$ to $1\frac{2}{3}$ times as long as broad, narrower in the young, as broad as or a little broader than the supraoculars; parietals $1\frac{1}{3}$ or $1\frac{1}{2}$ times as long as broad, in contact with the upper postocular†; occipital usually as long as or longer than the interparietal and broader than the latter.‡ Four supraoculars, first and fourth small, second a little longer than third; 5 or 6 superciliaries, suture between the first and second very oblique; a complete or incomplete series of rather large granules, 5 to 10 in number, between the supraoculars and the superciliaries. Rostral not touching the nostril; a single postnasal, usually as large as the anterior loreal, which is about half as long as the second; 4 upper labials anterior to the subocular, which is usually much narrower beneath than above; 3 to 5 upper temporals, the last the longest§; the rest of the temple covered with small scales, which are granular above and larger in front and below; a narrow tympanic shield usually present; 3 to 5 projecting pointed lobules on the anterior border of the ear.

Pterygoid teeth present.

Gular scales imbricate, 23 to 27 in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold

* Unless separated by a small azygos shield (as in a female from the Haria Valley).

† Except in one female from Lanzarote.

‡ Sometimes three times as large as the interparietal, according to Steindachner.

§ The reverse of the usual state of things.

distinct. Collar with more or less strongly serrated edge,* formed of 6 to 10 plates, the median usually the largest, the outer passing gradually into the scales.

Dorsal scales rhomboidal or squarish, oblique, more or less strongly and diagonally keeled, a little larger than the laterals, which are less distinctly keeled; 44 to 52 scales across the middle of the body; 23 to 27 transverse series, in the middle of the back, correspond to the length of the head, 2 or 3 on the sides to the length of one ventral plate. Ventral plates in 8 or 10 longitudinal series, those of the second, or second and third series from the median line a little broader than the others, the outermost narrow; 26 to 28 transverse series in males, 28 to 30 in females. Preanal plate rather small, bordered by 2 or 3 semicircles of small plates.

Scales on upper surface of tibia keeled, much smaller than dorsals. 17 to 23 femoral pores on each side, usually 18 to 21. 24 to 30 lamellar scales under the fourth toe.

Caudal scales oblique and strongly keeled above, truncate or obtusely pointed behind, in alternately longer and shorter whorls; 26 to 30 scales in the fourth or fifth whorl behind the postanal granules.

The coloration, in females and young, is very similar to that of *L. galloti*, from which some specimens are, in this respect, indistinguishable. The upper parts vary from yellowish grey to dark grey or olive. Some specimens are striated, a light, sometimes dark-edged streak extending from the superciliary border to the base of the tail, where it breaks up into spots, and another from below the eye, through the middle of the tympanum, to the anterior side of the thigh, reappearing on the base of the tail; between the dorsal streaks, and between these and the lateral streaks, two or four series of small ocellar spots may be present, those on the sides often blue; also a series of blue spots on each side of the belly. Head speckled with brown. Limbs with ocellar spots. Lower parts white; a Λ- or ⅄-shaped black or bluish grey marking on the throat, or throat grey or blue with a dark band following the chin-shields. Other small specimens lack the streaks or show mere traces of them and the body is spotted or marbled with dark brown, with 5 or 6 blue ocelli on each side. Sometimes the dark brown spots form two stripes on the back, enclosing small light ocellar spots. Adult males are dark olive or dark brown to blackish above, uniform or with numerous small ocellar spots on the back and two series of large blue ocelli on the sides; head marbled with black, or black with light variegations

* In exceptional cases, according to Steindachner, the collar shows no trace of serration.

above, black beneath as well as on the neck as far as the collar; belly greyish white or brownish olive.

Measurements (in millimetres):

	♂.	♀ (type).	♀.
From end of snout to vent	90	65	55
,, ,, fore limb	31	23	18
Length of head	23	15	13
Width of head	16	10	8·5
Depth of head	11	8	6·5
Fore limb	32	22	19
Hind limb	48	38	30
Foot	25	20	17
Tail	150	—	97

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.
♀ Lanzarote (type), **G.M.**	65	46	10	28	10	25	19	26
♂ ,, (Meade-Waldo)	90	50	10	26	7	25	20–22	24
,, ,, (,,)	75	49	8	27	7	27	19	26
,, ,, (,,)	68	47	8	28	9	27	21–20	28
,, ,, (,,)	65	49	10	28	9	24	22–20	25
,, ,, (Richter)	76	45	10	27	6	23	17 18	28
,, ,, (,,)	52	49	10	28	8	25	19–18	28
,, ,, (,,)	46	47	10	28	8	23	19–18	28
♀ ,, (,,)	60	47	10	30	7	25	20–18	28
,, Arrecife (type)	63	50	10	29	9	25	19–21	30
,, ,, (,,)	44	44	10	28	7	24	21	29
♂ Haria Valley	97	44	10	28	8	26	18–19	30
,, ,,	90	45	10	28	7	27	21	30
,, ,,	90	50	10	27	7	25	17	30
,, ,,	85	52	10	26	9	25	20	27
♀ ,,	66	47	8	29	9	25	20–19	25
,, ,,	62	46	8	29	7	25	23–22	27
,, ,,	55	45	10	30	8	25	21	30
,, Canary Islands	52	48	10	30	8	25	19–18	29

1. Length from snout to vent (in millimetres). 2. Scales across middle of body. 3. Longitudinal series of ventral plates. 4. Transverse series of ventral plates. 5. Plates in collar. 6. Gular scales in a median longitudinal series. 7. Femoral pores (right and left if differing). 8. Lamellar scales under the fourth toe.

Habitat.—Lanzarote, Fuertaventura, and neighbouring islands.*

* Lanzarote and Fuertaventura, waterless and treeless and nearer to the African coast, differ greatly from the other Canary islands in their fauna,

According to Peters and Doria also Teneriffe (Santa Cruz). The records of this species from Madeira and Mogador are no doubt due to erroneous localities in the British, Paris, and Milan Museums.

7. LACERTA CÆSARIS.

Lacerta galloti, part., Steind. Ann. Hofmus. Wien, vi, 1891, p. 288.
Lacerta cæsaris, Lehrs, Proc. Zool. Soc. 1914, p. 681.
Lacerta galloti cæsaris, C. Boettg. & L. Müll. Ann. & Mag. N. H. (8), xiv, 1914, p. 74.

Head rather large, the difference in size according to sexes not so marked as in *L. galloti* and its larger allies. Head 1½ times as long as broad, its length 4 times in length to vent in males, very little shorter in females; snout as long as postocular part of head in females, slightly longer in males; cheeks not noticeably swollen in males. Pileus twice as long as broad. Neck distinctly narrowed. The hind limb reaches the collar or not quite so far in females, a little beyond in males.

Rostral usually touching the nostril,* separated from the fronto-nasal, which is as long as broad or slightly longer; frontal a little shorter than its distance from the end of the snout in females, but slightly in males, twice as long as broad (in its narrowest part) in females, slightly longer in males; parietals as long as or slightly longer, rarely shorter, than the frontal in males, usually a little longer in females, strongly bent down on the temple, occupying the place usually held by the upper temporals; occipital at least as broad as the interparietal, usually considerably broader, and constantly broader than long, on an average longer in males than in females; supraoculars separated from the superciliaries by a series of granules. A single postnasal; 5 upper labials anterior to the subocular. Temporal scutellation granular, often finely, with more or less developed masseteric and tympanic shields; a series of small upper temporals. Scales covering the lower eyelid extremely small and granular, those in the centre scarcely, if at all, differentiated.

33 to 44 scales between the symphysis of the chin-shields and the collar; gular fold distinct; collar not serrated, composed of 7 to 11 plates.

Dorsal scales very small, rhombic-granular, more or less distinctly

which is nearly identical with that of the neighbouring Sahara (Tristram, Brit. Assoc. 1893).

* With two exceptions out of 14 specimens.

keeled, 90 to 110 across the middle of the body; 3 or 4 series on the side corresponding to one ventral plate. Ventral plates in 10 or 12 longitudinal and 29 to 31 transverse series. Preanal comparatively small.

24 to 31 femoral pores on each side. 30 to 36 lamellar scales under the fourth toe.

Coloration (from life). Head dark or light bronze-brown above, more or less profusely speckled with black. Dorso-lateral streak, if distinct, bright yellow, running on the parietal and continued to the base of the tail, or beyond; a light streak along the spine, well-defined from the bronze colour of the dorsal region. A short postocular streak, of a duller yellow than the superciliary, and often interrupted, extends a little way beyond the tympanum in the middle of the dark brown lateral band, which is edged below by a continuous dull yellow streak, extending from below the tympanum to the base of the hind limb, reappearing again on the side of the tail. The dark bands in some specimens (young males) with small light, dark-edged spots without any tendency to form transverse series.* Larger bright spots on the limbs. Frequently a small sky-blue spot on the dark lateral band above the insertion of the fore limb, and another of the same colour on the upper arm. In some fully adult males the markings become very indistinct or may nearly entirely vanish, such specimens being blackish brown.

Lower surface of head blackish grey, or even black in full-grown specimens, the dark shade sometimes extending to the breast; belly dirty white, or pale greyish, without any spots, a few roundish bluish white spots sometimes present on the margin; lower surface of thighs sometimes sky-blue in females.

Measurements (in millimetres):

	♂.	♂.	♀.	♀.
From end of snout to vent . .	74	54	77	66
,, ,, fore limb .	30	23	28	25
Length of head	18·5	14·5	18	16
Width of head	12	9·5	12	10
Depth of head	9	7	8·5	7·5
Fore limb	28	21	27	23
Hind limb	45	34	41	36
Tail	—	—	—	152

* Except for the presence of a light vertebral streak, all these markings agree pretty well with those of the young *L. galloti*.

Particulars of Specimens examined by Lehrs.

	1.	2.	3.	4.	5.	6.	7.	8.
♂ . .	74	90	10–12	30	7	40	29–30	—
„ . .	72	102	12	30	11	44	29	32
„ . .	72	105	12	30	9	43	27–26	35
„ . .	68	98	10–12	30	7	39	31–30	30
„ . .	56	110	10	29	9	42	28	36
„ . .	54	98	12	29	8	43	28–27	33
♀ . .	77	96	10–12	31	9	38	29–28	33
„ .	72	100	10	30	11	40	29–28	33
„ . .	70	99	10	30	7	33	25–24	33
„ . .	66	91	12	30	8	36	26	33
„ . .	66	95	12	30	10	38	25	31
„ . .	59	95	10	31	11	43	28–26	34
„ . .	54	94	10	30	10	41	27	32
„ . .	53	91	12	31	9	39	28–29	33

Columns same as on p. 114.

Habitat.—Hierro, Canary Islands.

The above description is taken from that given by Dr. Lehrs.

The following form, of which I have not seen specimens, is probably to be regarded as a variety of *L. cæsaris*, but the description is not sufficient, structural characters being omitted.

Lacerta galloti gomeræ, C. Boettger and L. Müller, Ann. & Mag. N. H. (8) xiv, 1914, p. 73.

"Colour of males dark. Markings, if at all present, reduced to longitudinal stripes. Very small light yellow or grey points, found all over the back, must apparently be regarded as the last traces of transverse bars. Except these points and some blue eye-spots, there are no markings on neck and anterior back; but there are traces of dark bands on posterior back and root of tail on a slightly paler ground. In very dark specimens head and neck are deep black, as is also lower surface, except that of tail, which is reddish grey. Posterior portion of belly sometimes paler. The two lateral rows of ventrals with more or less numerous blue spots. There are also blue spots on the limbs, of which a larger one on upper arm close behind shoulder and one on thigh are especially characteristic for this race. In the lighter specimens, which are clay coloured, there are two comparatively narrow dorso-lateral bands from parietals to root of tail, where they fuse on neck and anterior back. They are bounded below by a narrow pale stripe. Lower surface as in the dark specimens.

"Ground-colour of female greyish to reddish-brown. From superciliaries to first third of tail a yellowish brown stripe, which is light and narrow anteriorly, broader and darker posteriorly, and margined posteriorly on each side by a narrow brownish-black band, both of which fuse on anterior fourth of tail.

Laterally follow a broad dark lateral band, margined by a light line, which begins below the auditory meatus and is only distinct on neck and anterior back. A light stripe from eye across masseteric and upper margin of auditory meatus, [which is] broken up into spots in the temporal region. Throat, chest, and anterior portion of belly black as in male. Posterior portion of belly lighter, bluish grey. Flanks with occasional light spots, probably the remains of transverse bars. Small blue spots at upper end of limbs as in males.

"Young. Colour as in female. Lower surface much lighter, pale reddish yellow. Throat deep black, with some light spots on sides of neck."

Largest male 102 millim. from snout to vent, largest female 83.

Habitat.—Gomera.

8. LACERTA GALLOTI.

Lacerta galloti, Dum. & Bibr. Erp. Gén. v, p. 238 (1839); Gerv. in Webb & Berthel. H. N. Iles Canaries, Rept. p. 4, pl. i, figs. 1–5 (1844); Boettg. Abh. Senck. Ges. ix, 1874, p. 174; Bedriaga, Arch. f. Naturg. 1879, p. 325; Bouleng. Proc. Zool. Soc. 1881, p. 740; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 301; Bouleng. Cat. Liz. iii, p. 41 (1887); Schenkel, Verh. Nat. Ges. Basel, xiii, 1901, p. 186; Lehrs, Zool. Jahrb., Syst. xxviii, 1909, p. 93, pl. ii, fig. 3; C. Boettg. & L. Müll. Ann. & Mag. N. H. (8) xiv, 1914, p. 68.

Zootoca derbiana, Gray, Cat. Liz. p. 29 (1845).

Zootoca galloti, part., Gray, op. cit. p. 30.

Lacerta galloti, part., Steind. Ann. Hofmus. Wien, vi, 1891, p. 288.

Lacerta galloti palmæ, C. Boettg & L. Müll., t. c., p. 71.

Similar in form to *L. viridis*, var. *major*. Body more or less depressed, sometimes subquadrangular with the back quite flat. Head $1\frac{2}{3}$ to $1\frac{1}{2}$ times as long as broad, its depth equal to the distance from the anterior corner of the eye to the tympanum, its length about 4 times in length to vent; snout obtusely pointed, as long as post-ocular part of head; cheeks strongly swollen in the males. Pileus 2 to $2\frac{1}{4}$ times as long as broad. Neck more or less constricted. The hind limb reaches the shoulder or the collar in males, the axil, the shoulder, or the collar in females. Foot $1\frac{1}{5}$ to $1\frac{1}{3}$ times length of head; digits rather slender, feebly compressed. Tail cylindrical, 2 to $2\frac{2}{5}$ times length of head and body.*

Nostril pierced between 3 or 4 shields. Suture between the nasals not $\frac{1}{2}$ the length of the frontonasal, which is as long as broad or a little broader, and broader than the internarial space; pre-

* The tail is regenerated in most of the adult specimens in collections. This accounts for the statement "*cauda non raro abbreviata*" in Bedriaga's diagnosis of the species.

frontals forming an extensive suture*; frontal as long as its distance from the nasals or the rostral, $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad,† broader than the supraoculars, sometimes with a median groove; parietals $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, in contact with the upper postocular; occipital usually as long as or longer than the interparietal, and often much broader, sometimes as broad as the frontal. Four supraoculars, first and fourth small, second often a little longer than third; 5 to 7 superciliaries, suture between first and second oblique; a series of granules, complete or incomplete, 7 to 12 in number, between the supraoculars and the superciliaries. Rostral usually not entering the nostril,‡ a single postnasal, a little smaller than the anterior loreal, which is about half or $\frac{3}{5}$ as long as the second; 5 upper labials§ anterior to the subocular, which is much narrower beneath than above; 4 to 7 small upper temporals, the last usually the largest; the remainder of the temple covered with granular scales with a more or less enlarged masseteric shield‖ and a narrow tympanic.

Pterygoid teeth present.

Gular scales flat, juxtaposed or feebly imbricate, 32 to 50 between the symphysis of the chin-shields and the median collar-plate, one or two series of granules sometimes separating the third pair of chin-shields; gular fold more or less distinct. Collar entire or very slightly serrated, composed of 9 to 14 plates.

Dorsal scales roundish-rhomboidal, keeled, separated by minute granules, the keels diagonal; 78 to 101 scales across the middle of the body¶; 42 to 55 transverse series, in the middle of the back, correspond to the length of the head, 3 or 4 on the side correspond to one ventral plate. Ventral plates in 12 or 14 longitudinal** series, usually only those of the second and third series from the median line broader than long; 29 to 31 transverse series. Preanal plate small or very small, bordered by 2, 3, or 4 semicircles of small plates, and by small granules behind.

Scales on upper surface of tibia smaller than dorsals, keeled, sometimes tricarinate. 23 to 31 femoral pores on each side. 29 to 37 lamellar scales under the fourth toe.

* Separated by an azygos shield in 3 females.

† Sometimes not longer than broad, according to C. Boettger and L. Müller.

‡ Exception in a female in the Paris Museum.

§ 6 on one side in two females.

‖ Rarely absent according to C. Boettger and L. Müller.

¶ 87 to 106 according to C. Boettger and L. Müller.

** The smaller outer plates, which are separated from their fellows in the longitudinal series by scales, are not reckoned.

Caudal scales very narrow and keeled, strongly above, truncate or rounded behind, the whorls not very unequal in length and those on the anterior part of the tail separated by rows of minute granules; 40 to 53 scales in the fifth whorl.

Young grey or brown above, with a light dorso-lateral streak, bordered on the inner side by a dark brown band or streak, which may extend to the tail, where the dark streaks fuse into one, or disappear about the middle of the body; one other light streak from below the eye, through the lower part of the tympanum, to the shoulder or to the anterior side of the thigh, reappearing on the side of the tail; sometimes a third light streak, from behind the eye, over the upper border of the tympanum, lost on the neck; a dark lateral band, with two or three series of small ocellar spots, some of which may be blue; upper surface of head with dark specks; limbs with ocellar spots. Lower parts whitish, with chevron-shaped grey streaks, apex forward, on the gular region.

Adult females retain at least traces of these markings, but the ocellar spots are multiplied and may form irregular transverse series on the back; a more or less distinct black band on the back of the thigh; belly dirty white, or greyish with round white and blue spots on the sides.

Adult males dark brown or olive with very numerous green, black-edged ocellar spots which form more or less irregular transverse series on the back; larger blue spots on the sides, the largest above the shoulder; head black or blackish brown above and beneath; a large pale blue blotch may be present on the side of the head below the temple, and also on the masseteric shield.* Some specimens blackish brown above, with the ocellar markings very indistinct, and with one or two very large yellowish or blue spots above the shoulder. Belly black in front, gradually shading to grey behind, with more or less numerous irregular yellow or blue spots on the sides.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.
♀ Teneriffe (type), **P.M.** .	82	85	12	30	11	48	30	29
♂ „ (Verneau), **P.M.** .	115	91	14	30	10	41	26–28	31
„ „ („) „ .	115	86	12	30	13	41	24–23	31

* This is the "enormous cheek-patch of a bright blue colour" regarded by C. Boettger and L. Müller as a "very distinctive character of the male" of their *L. galloti palmæ*, from the Island of Palma. It is quite as much developed in a male from Teneriffe, from the 'Challenger' collection. This blue blotch is also mentioned by Steindachner, but without any reference to the locality.

	1.	2.	3.	4.	5.	6.	7.	8.
♂ Teneriffe (Webb & Berthelot), **P.M.**	105	88	14	30	10	40	25	32
♀ „ („), **P.M.**	85	92	12	31	11	41	30	34
♂ Canary Ids.	115	93	14	30	12	48	30–28	37
Yg. „	45	95	12	31	11	48	29–28	33
♂ Santa Cruz	120	83	12	30	11	44	26	36
♀ Orotava, **G.M.**	97	78	12	30	14	32	25–23	32
♂ Canary Ids.	100	84	12	30	11	39	24–25	29
„ „	90	93	12	31	11	43	26–24	34
♀ „	83	88	12	31	12	50	25	33
Yg. „	60	92	12	29	13	43	24–25	35
♂ „ (Buchet), **P.M.**	109	101	12	29	9	42	27	34
„ „ („) „	87	82	12	29	10	42	28	33
„ „ („) „	83	96	12	29	11	39	29–30	33
♀ „ („) „	70	97	12	30	10	40	27–26	33
„ „ (Talisman) „	84	88	12	30	10	40	26–25	34
„ „ („) „	72	90	12	29	10	45	28–27	33
♀ (type of *Z. derbiana*)	93	88	14	31	11	43	28–26	37
Yg. („)	68	88	12	29	11	45	25	36
♀ (Mogador)	112	99	12	31	9	44	26–23	35
„ („)	95	100	12	30	11	45	31–30	31
Yg. („)	54	98	12	30	12	43	25–26	35

Columns same as on p. 114. For Measurements, see p. 126.

The largest male on record measures 135 millim. from snout to vent, the largest female 126 millim.

Habitat.—Teneriffe and La Palma, Canary Islands. The reported occurrence of this species in Madeira and at Mogador has not been confirmed.

9. LACERTA STEHLINI.

Lacerta simonyi, part., Steind. Ann. Hofmus. Wien, vi, 1891, p. 290; Siebenr. Sitzb. Ak. Wien, ciii, i, 1894, p. 249.

Lacerta galloti, var. *stehlini*, Schenkel, Verh. Nat. Ges. Basel, xiii, 1901, p. 187.

Similar in size and proportions to *L. ocellata*. Head $1\frac{2}{5}$ to $1\frac{1}{2}$ times as long as broad, its depth equal to the distance from the anterior border of the eye and the tympanum, its length about 4 times in length to vent; snout obtusely pointed, as long as postocular part of head; cheeks strongly swollen in males. Pileus 2 to $2\frac{1}{5}$ times as long as broad. Neck narrower than the head. The hind limb reaches the axil in males, the axil or the elbow of the adpressed fore limb

in females. Foot 1 to $1\frac{1}{4}$ times length of head; digits rather thick and feebly compressed distally. Tail cylindrical, or squarish and a little depressed at the base, about twice as long as head and body.

Nostril pierced between three shields. Suture between the nasals not half the length of the frontonasal, which is broader than long and broader than the internarial space; prefrontals forming an extensive suture; frontal as long as its distance from the nasals, $1\frac{2}{3}$ to $1\frac{1}{2}$ times as long as broad in adults (about twice in young), broader than the supraoculars; parietals $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, not in contact with the upper postocular; occipital as long as or shorter than the interparietals, and usually broader, sometimes as broad as the frontal; a small shield sometimes intercalated between the interparietal and the occipital. Four supraoculars, first and fourth small, second sometimes a little longer than third; 5 to 7 superciliaries, suture between the first and second oblique; a complete or incomplete series of granules, 7 to 12 in number, between the supraoculars and the superciliaries. Rostral not touching the nostril; a single postnasal,* a little smaller than the anterior loreal, which is about half as long as the second and sometimes divided into two; 5 or 6 upper labials† anterior to the subocular, which is more or less narrowed beneath; 2 or 3 large upper temporals, the first in contact with the fourth supraocular; below them the temple is covered with granular scales, larger in front and beneath, enclosing a large masseteric shield; a narrow tympanic shield, sometimes broken up.‡

Pterygoid teeth present.

Gular scales granular in front, a series often separating the third pair of chin-shields, larger and feebly imbricate towards the collar; 37 to 49 scales in a straight line between the symphysis of the chin-shields and the median collar-plate; no gular fold. Collar not or but feebly serrated, composed of 10 to 17 plates, the median sometimes larger, sometimes smaller, than the others.

Dorsal scales oval or rhomboidal, rather strongly keeled, surrounded by circles of minute granules; 79 to 93 scales across the middle of the body; 36 (♂) to 50 (♀) transverse series of scales, in the middle of the back, correspond to the length of the head, 3 or 3 and 4 on the sides to the length of one ventral plate. Ventral plates in 16 to 20 longitudinal series, squarish or a few broader than long; on the posterior half of the belly the plates do not form regular longitudinal series, but are oblique or tessellated; 33 to 36 transverse

* Occasionally divided into 2 or 3 according to Schenkel.

† 6 in 7 cases out of 20.

‡ Altogether 75 to 110 scales and shields on the temple, as against 30 to 36 in *L. simonyi*.

series. Preanal plate small, sometimes replaced by three plates forming a triangle; 3 semicircles of smaller plates on the preanal region, and granules bordering the preanal shield posteriorly.

Scales on upper surface of tibia similar to dorsals, but smaller and sometimes tricarinate. 24 to 31 femoral pores on each side. 31 to 35 lamellar scales under the fourth toe.

Caudal scales very narrow and keeled, strongly above, truncate or rounded behind, the whorls not very unequal in length, and those on the anterior part of the tail separated by minute granules in several rows; 54 to 66 scales in the fifth whorl.

Young greyish brown above, with a more or less distinct light dorso-lateral streak from the outer border of the parietals to above the shoulder, where it breaks up into a series of 10 or 11 round spots; a second light streak may be present from the eye to above the tympanum, and a third from below the eye to the shoulder, passing through the lower third of the tympanum; the dorso-lateral streak bordered inwards by a dark brown streak breaking up into spots corresponding to the light ones, each bearing one or two light dots; small dark spots or ocelli on the back between the dorso-lateral streaks; sides with vertical series of 3 or 4 ocelli corresponding to the dorso-lateral series; upper surface of head with small dark brown spots; limbs with ocellar spots; base of tail with two dorsal series of dark spots and a light, dark-edged lateral streak; lower parts whitish, throat with oblique grey streaks forming chevrons open behind.

According to Steindachner a light vertebral streak is sometimes present on the posterior half of the body.

With age the longitudinal arrangement of the markings disappears and the greyish or reddish brown back is covered by transverse series of very numerous small ocelli which may run together to form 14 or 15 narrow light cross-bars, more or less broken up. Adult males with the head and tail reddish brown, uniform or the latter with round yellowish spots. The markings on the throat disappear in the males, which are grey or greyish brown beneath, the lower surface of the head sometimes yellowish; belly of adult females also grey, or bluish grey.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.
♂ (Vienna Museum) . .	152	85	16	35	14	47	28–29	34
,, ,, ,, . .	117	93	18	34	10	49	31–30	34
♀ ,, ,, . .	122	84	16	34	12	44	27–29	31

	1.	2.	3.	4.	5.	6.	7.	8.
♂ (Baring and Grant) .	146	86	16	36	13	46	29–28	33
„ „ „ . .	105	81	16	33	17	46	26–27	33
„ „ „ . .	100	81	16	34	13	43	28	35
Yg. „ „ . .	75	79	16	35	11	39	24–25	33
„ (Richter) . . .	81	84	18	36	12	47	29–27	32
„ „	60	85	18	36	17	43	30–29	34
„ (Poulton*) . . .	53	80	20	33	17	37	28	35

Columns as on p. 114. For measurements see p. 126.

Habitat.—This species is only known from Gran Canaria.

10. LACERTA SIMONYI.

Lacerta simonyi, Steind. Anz. Ak. Wien, 1889, p. 260; Bouleng. Proc. Zool. Soc. 1891, p. 201, pls. xviii and xix.

Lacerta simonyi, part., Steind. Ann. Hofmus. Wien, vi, 1891, p. 290; Siebenr. Sitzb. Ak. Wien, ciii, i, 1894, p. 205.

Very similar to the preceding. Head uneven above, $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as deep, its depth equal to the distance between the anterior border of the eye and the tympanum, its length about $3\frac{3}{4}$ times in length to vent in the male, $4\frac{1}{2}$ times in the female; snout obtusely pointed, as long as postocular part of head or slightly longer; cheeks strongly swollen in the male. Pileus $2\frac{1}{3}$ to $2\frac{1}{2}$ times as long as broad. Neck narrower than the head. The hind limb reaches the axil in the male, the elbow of the adpressed fore limb in the female. Foot a little longer than head; digits rather thick and feebly compressed distally. Tail cylindrical, a little depressed at the base.

Nostril pierced between four shields. Suture between the nasals not half the length of the frontonasal, which is broader than long and broader than the internarial space; prefrontals forming an extensive suture; frontal as long as broad (adult), shorter than its distance from the nasals, nearly twice as broad as the supraoculars; parietals $1\frac{1}{3}$ times as long as broad, not in contact with the upper postocular; occipital as long as and broader than the interparietal, fully $\frac{2}{3}$ the width of the frontal. Four supraoculars, first and fourth small, second and third equal; 6 to 8 superciliaries, suture between first and second slightly oblique; a series of 8 to 11 granules between the supraoculars and the superciliaries.

* Originally labelled as from Orotava, but I have no doubt it came from Gran Canaria, like the other reptiles presented along with it by Prof. Poulton.

Rostral entering the nostril; a single postnasal, a little smaller than the anterior loreal, which is nearly half the length of the second; 5 upper labials anterior to the subocular, which is but little narrowed inferiorly; two or three large upper temporals, first in contact with fourth supraocular; temple covered with large irregular shields, among which a more or less distinct masseteric and a narrow tympanic.

Pterygoid teeth present.

Gular scales granular in front, a little larger and subimbricate towards the collar; 28 to 34 scales in a straight line between the symphysis of the chin-shields and the median collar-plate; no gular fold. Collar strongly serrated, formed of 10 or 13 plates.

Dorsal scales oval, strongly keeled, surrounded by minute granules, 95 to 100 across the middle of the body*; 36 to 43 transverse series, in the middle of the back, correspond to the length of the head, 2 or 3 on the sides to one ventral plate. Ventral plates in 18 or 20 longitudinal series, squarish; on the posterior half of the belly they are tessellated or form oblique series towards the median line; 34 to 36 transverse series. Preanal plate small, bordered by three semicircles of small scales, and followed by two or three series of small granules.

Scales on upper surface of tibia similar to dorsals, but smaller. 29 to 33 femoral pores on each side, 31 to 33 lamellar scales under the fourth toe.

Caudal scales very narrow and keeled, strongly above, truncate behind, the whorls not very unequal in length, and separated on the anterior part of the tail by minute granules in several rows; 56 scales in the fifth whorl.

The two specimens, male and female, from which the above description is taken, are blackish brown above, with two lateral series of large roundish pale yellow spots, the upper of 6 or 7, gradually decreasing in size from front to back, the lower, extending on to the outer ventrals, of 3 or 4. Lower parts brown, yellowish in the middle of the belly, some of the ventrals tinged with red; throat dark brown or blackish.

The particulars of these specimens are as follows:

	1.	2.	3.	4.	5.	6.	7.	8.
♂ . . .	210	95	20	34	13	34	31	31
♀ . . .	200	100	18	36	10	28	29–33	33

Columns as on p. 114.

According to Steindachner the half-grown female is grey above, with

* 84 to 90 according to Steindachner.

four series of ill-defined irregular blackish spots on the back, and two series of yellowish green spots on each side.

Habitat.—The Roques del Zalmor, near Hierro. The same large lizard is also said to have been found on Hierro itself.

Measurements (in millimetres) of *L. galloti* (1, 2), *stehlini* (3, 4), and *simonyi* (5, 6).

	1. ♂	2. ♀	3. ♂	4. ♀	5. ♂	6. ♀
From end of snout to vent . .	120	112	152	105	210	200
,, ,, ,, fore limb	45	45	54	39	90	70
Length of head	30	28	38	25	57	44
Width of head	21	19	27	17	45	30
Depth of head	16	15	20	14	33	25
Fore limb	46	42	52	37	80	67
Hind limb	68	70	80	58	120	96
Foot	38	38	39	29	63	47

Section III. Zootoca, Wagl.—Transverse series of ventral plates with notches between the plates,* longitudinal series 6 or 8; collar serrated; a single postnasal (exceptionally 2); femoral pores 5 to 15; pterygoid teeth absent (with very rare exceptions).

A. Parietal foramen present.

25 to 37 scales across body, dorsals usually keeled, rarely smooth; preanal shield bordered by two (rarely one) semicircles of smaller shields; granules between supraoculars and superciliaries absent or reduced to 1 to 4; hind limb reaching wrist or elbow in males, not beyond wrist in females; 5 to 15 femoral pores; 14 to 20 lamellæ under fourth toe.
L. vivipara, Jacq., p. 127.

32 scales across body, dorsals smooth, faintly keeled towards tail; preanal shield bordered by two semicircles of smaller shields, the median of the inner series transversely enlarged; 4 or 5 granules between supraoculars and superciliaries; hind limb reaching wrist in female; 14 or 15 femoral pores.
L. fraasii, Lehrs, p. 140.

38 to 53 scales across body, dorsals smooth or feebly keeled, laterals not smaller; preanal shield bordered by a single semicircle of smaller shields, rarely by two; 2 to 12 granules between supraoculars and superciliaries; hind limb reaching elbow or axil in males, wrist in females; 6 to 12 femoral pores; 21 to 26 lamellæ under fourth toe . *L. derjugini*, Nik., p. 142.

* Except in some specimens of *L. derjugini*, in which the border is nearly straight, as in *L. muralis*, thus completely filling up the gap between this Section and *Podarcis*.

32 to 43 scales across body, dorsals keeled, laterals smaller; preanal shield bordered by a single semicircle of smaller shields; 3 to 11 granules between supraoculars and superciliaries; hind limb reaching elbow or axil in males, wrist in females; 9 to 14 femoral pores; 21 to 25 lamellæ under fourth toe . . . . . *L. praticola*, Eversm., p. 145.

B. No parietal foramen.

38 to 50 scales across body, dorsals keeled, laterals smaller; preanal shield bordered by a single semicircle of smaller shields; a series of granules between supraoculars and superciliaries; hind limb reaching collar in males, beyond axil in females; 7 to 10 femoral pores . . . *L. vaucreselli*, Torn., p. 149.

As shown by Parker's* and Bayer's† figures, and as confirmed by Siebenrock,‡ there is only one postfrontal bone in *L. vivipara*, even at an early age, instead of two as in *L. agilis*. The two are distinct in *L. derjugini* and *L. praticola*, a feature which shows that these species cannot have been derived from *L. vivipara*; their common ancestor must have been intermediate between the latter and *L. agilis*.

11. LACERTA VIVIPARA.

Lacerta agilis, part., Linn. S. N. i, p. 363 (1766); Schulz, Faun. March. p. 448 (1845).

Lacerta vivipara, Jacquin, Nov. Act. Helvet. i, 1787, p. 33, pl. i; Reichenb. Isis, 1837, p. 511; Dum. & Bibr. Erp. Gén. v, p. 204 (1839); Milde, Verh. Zool.-bot. Ges. Wien, xx, 1870, p. 1033; Fatio, Vert. Suisse, iii, p. 81 (1872); Leydig, Deutschl. Saur. p. 212 (1872); Schreib. Herp. Eur. p. 429 (1875); Lataste, Herp. Gir. p. 77 (1876); Collin de Plancy, Bull. Soc. Sc. Semur, 1877, p. 24, and Bull. Soc. Zool. France, 1877, p. 349; F. Müll. Verh. Nat. Ges. Basel, vi, 1878, p. 413; Camerano, Mon. Saur. Ital. p. 82, pl. ii. (1885); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 338; Bouleng. Cat. Liz. iii, p. 23 (1887); Méhely, Beitr. Mon. Kronstadt, Herp. p. 16 (1892); Bureau, Bull. Soc. Sc. Nat. Ouest France, iii, 1893, p. 59, pl. i; Douglass, Herp. Baden, p. 15 (1894); Martin & Rollinat, Vert. Dép. Indre, p. 283 (1894); Werner, Rept. Amph. Oesterr.-Ung. p. 33 (1897); Dürigen, Deutschl. Amph. Rept. p. 167, pl. xii, figs. 1, 2 (1897); Gadeau de Kerville, Faune Normand. iv, p. 165 (1897); Werner, Wiss. Mitth. Bosn. Herzeg. vi, 1899, p. 819; Nikolsky, Fedtschenko's Reise, Zool. ii, pt. viii, p. 32 (1899); Kiritzescu, Bul. Soc. Sc. Bucur.

* Phil. Trans. R. S. 1879, pl. xli.

† Vestn. Cesk. Spol. Nauk (Prague), 1893, pl. v.

‡ Sitzb. Ak. Wien, ciii, i, 1894, p. 240.

x, 1901, p. 312; Barbier, Bull. Soc. Sc. Elbeuf, xxi, 1903, p. 5, pl.; Nikolsky, Herp. Ross. p. 115 (1905); Stejneg. Herp. Japan, p. 251, fig. (1907); Fejervary, Beitr. Herp. Rhônetal, p. 38 (1909); Cuzunov, Ann. Mus. Zool. St. Pétersb. xvi, 1911, p. 229; Kovatcheff, Herp. Bulg. p. 28 (1912); Schreib. Herp. Eur., ed. 2, p. 511 (1912); Scharff, Proc. Irish Acad. xxxi, 1912, No. 18; Bouleng. Journ. Zool. Res. ii, 1917, p. 1, figs.

Lacerta agilis, Sheppard, Tr. Linn. Soc. vii, 1804, p. 49; Jenyns, Man. Brit. Vert. p. 292 (1835).

Lacerta oedura, Sheppard, t.c. p. 50.

Lacerta crocea, Wolf, in Sturm, Deutschl. Faun. iii, pt. iv (1805); Menge, N. Schrift. Nat. Ges. Danzig, iv, 3, 1850, p. 41.

Lacerta nigra, Wolf, op. cit.

Lacerta montana, Mikan, in Sturm, op. cit.

Lacerta pyrrhogaster, Merr. Tent. Syst. Amph. p. 67 (1820).

Lacerta muralis, part., Lichtenst. Verz. Doubl. Mus. Berl. p. 92 (1823).

Lacerta schreibersiana, M.-Edw. Ann. Sc. Nat. xvi, 1829, pp. 68, 83; Gachet, Act. Soc. Linn. Bord. v, 1832, p. 233.

Zootoca vivipara, Wagl. Syst. Amph. p. 155 (1830); Bonap. Icon. Faun. Ital. (1836); Bell, Brit. Rept. p. 32, fig. (1839); Gray, Cat. Liz. p. 27 (1845); De Betta, Mem. Acc. Verona, xxxv, 1857, p. 139, and Fauna d'Ital., Rett. Anf. p. 22 (1875); Lessona, Atti Acc. Torin. xvi, 1879, p. 1135.

Lacerta chrysogastra, Andrzej. N. Mém. Soc. Nat. Mosc. (2) ii, 1832, p. 325.

Zootoca crocea, Fitzing. Beitr. Landesk. Oesterr. i, p. 326 (1832); Glücksel. Lotos, 1851, p. 136; Jeitteles, Verh. Zool.-bot. Ges. Wien, xii, 1862, p. 279.

Zootoca jacquin, Cocteau, Mag. Zool. 1835, Rept. pl. ix.

Zootoca guerin, Cocteau, l.c.

Zootoca pyrrhogastra, Tschudi, N. Denkschr. Allg. Schweiz. Nat. Ges. i, 1837, No. 4, p. 127.

Zootoca montana, Tschudi, t.c., p. 136.

Atropis nigra, Glücksel. Lotos, 1851, p. 138.

Lacerta vivipara, var. *pallida*, Fatio, op. cit., p. 88.

Lacerta vivipara, var. *carniolica*, Werner, Rept. Amph. Oesterr.-Ung. p. 34.

Body not or but feebly depressed. Head small, $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad, its depth equal to the distance from the anterior corner of the eye to the anterior or the posterior border of the tympanum, its length 4 or 5 times in length to vent in males, $4\frac{3}{5}$ to

6 times in females; snout obtuse, as long as the distance between the eye and the tympanum; cheeks not swollen. Pileus $1\frac{2}{3}$ to $1\frac{3}{4}$ times as long as broad. Neck at least as broad as the head, often considerably broader. Limbs short; the hind limb reaches the wrist or the elbow of the adpressed fore limb in males, the tips of the fingers or the wrist, or even not quite so far, in females. Foot 1 to $1\frac{1}{3}$ times length of head. Digits scarcely compressed. Tail cylindrical, often of about the same thickness through its anterior half,* but sometimes gradually tapering from the base and shaped exactly as in *L. agilis* or *L. viridis*; its length $1\frac{1}{4}$ to $1\frac{2}{3}$ times head and body in females, $1\frac{1}{2}$ to 2 times in males; not or but scarcely longer than head and body in the very young.

Nostril pierced between 2 or 3 shields. Rostral not touching the nostril, sometimes produced at an acute angle between the nasals, the suture between which is short or very short†; frontonasal broader than long, usually as broad as the internarial space, sometimes a little narrower, sometimes a little broader,‡ in contact with the anterior loreal or the single loreal, sometimes with both the loreals or with both the postnasal and the anterior loreal; suture between the prefrontals often very short§; frontal as long as its distance from the rostral or the end of the snout, or slightly longer, $1\frac{1}{2}$ to 2 times as long as broad, usually hexagonal, as broad in front as behind, very rarely a little narrower behind, usually broader than the supraoculars in the adult; parietals not or but little longer than broad,‖ in contact

* As occasionally happens in *L. muralis*.

† Rostral exceptionally in contact with frontonasal—males from Bournemouth, Brussels, Aube, Bordeaux, females from Lhanbryde, Mont Dore, and St. Peter, Carniola.

‡ Exceptionally in contact with frontal—males from Brussels, Padun, Kirghiz Steppes, and Sachalien, females from Norway, Uralsk, and Sachalien, young from Schneeberg and Dambovita. Barbier (l.c.) has also come across such specimens in Normandy.

§ An azygos prefrontal in males from Bozau and Solowitski Id., in females from La Bourboule and Sachalien, and in a young from Boussers; a pair of small shields side by side between the larger prefrontals in a male from Nikolavsk.

‖ Bedriaga has drawn attention to a specimen from Sachalien in which each parietal is divided into two. A more or less complete transverse cleft on the parietals, proceeding from the occipital, such as occurs in *L. muralis* from Lower Austria, is frequent, and this anomaly may be transmitted to the offspring, as shown by a female from Ostend with her four young born in captivity. Bedriaga also mentioned that the same specimen from Sachalien has each frontoparietal divided into two, and a female from the same island, received from Prof. Hatta, shows the same anomaly. I find a partial division of the frontoparietals in a male from Nikolavsk, Amoor.

with 2 to 4 temporals; occipital very variable, always shorter than the interparietal, though sometimes but slightly, as broad or a little broader, exceptionally minute,* its posterior border often convex and projecting beyond the parietals; a small shield is sometimes intercalated between the interparietal and the occipital.† Normally four supraoculars,‡ first small,§ sometimes divided into two or even, very rarely, three, or minute, reduced to a granule, rarely absent, second and third large, equal or second the longer, fourth small but larger than first, sometimes fused with the upper postocular, often not in contact with the frontoparietal; sometimes a fifth small supraocular; 4 to 6 (rarely 3) superciliaries, usually all in contact with the supraoculars, sometimes with 1, 2, or 3, or even 4|| granular scales between them; suture between the first and second superciliaries usually vertical.

The nasal sometimes forms a narrow rim separating the nostril from the first upper labial and is frequently in contact with the upper part of the anterior loreal; a single postnasal,¶ often small; anterior loreal sometimes divided into two superposed shields, or absent**; the postnasal and the two anterior loreals sometimes form together a triangle, as in *L. agilis*; 3 or 4, very rarely 5, upper labials anterior to the subocular,†† which is often nearly as long above as beneath, but varies considerably in form. Temporal shields very variable in shape

* Males from Unterberg and Boussers, females from Poole and La Bourboule. In a male from La Ferté-Macé, in another from Nikolavsk, and in a third from Sachalien, there are 3 occipitals in a transverse line; in a female from St. Peter, Carniola, there are 5; in a female from Norway, 3 occipitals forming a triangle.

† This anomaly, although less frequent than in *L. praticola*, is found in a good many specimens (Denmark, Bloxworth, Falmouth, Clare Id., Rambouillet, Aube, Brussels, Brosteni, Dambovita, Moscow, Sachalien) about in the same proportion as in *L. muralis*.

‡ 5 on one side in a male from Brighton, on both sides in a female from Val del Fain, near Pontresina.

§ Rarely rather large and extensively in contact with the frontal (female from Cappagh), as figured by Leydig, op. cit.

|| Males from Thetford and Fowey, female from Rhyl. 2 or 3 granules is not very exceptional.

¶ 2 superposed postnasals on the right side in a female from Heyst and on the left side in another from Sachalien (Anderson).

** In about 50 per cent. of the British specimens.

†† 4 is on the whole more frequent than 3, but in British specimens both numbers are about of equal frequency, and in a series of Roumanian specimens there are 3 in 18 cases out of 26. 5 anterior labials on the right side in males from Bloxworth, Unterberg, and Moscow, on the left side in a female from Heyst.

and size,* the upper, in contact with the parietal, sometimes large and two in number, sometimes scarcely differentiated, the first, which may be long and narrow, only exceptionally† in contact with the last supraocular; a masseteric plate often, and a tympanic nearly constantly distinguishable, the latter very rarely broken up into two; in exceptional cases‡ the temporal lepidosis is not different from that of a typical *L. muralis*.

Pterygoid teeth nearly always absent.

5 or 6 pairs of chin-shields, the three anterior in contact in the middle§; gular scales increasing in size towards the collar, sometimes nearly as large as the plates of the latter, 12 to 22 (usually 15 to 19) between the symphysis of the chin-shields at the median collar-plate; gular fold usually absent or very indistinct.‖ Collar usually strongly serrated, rarely rather feebly,¶ composed of 7 to 12 plates, usually 8 to 10.

Scales round and flat or convex on the nape; elongate rhombic or hexagonal, oval or squarish-oval, or not or but scarcely broader than long, more or less strongly keeled, sometimes nearly smooth except towards the tail,** juxtaposed or feebly imbricate on the back††; often rather smaller on the upper part of the sides, again increasing in size and losing the keels towards the ventrals; 25 to 37, usually 30 to 35, across the middle of the body; 11 (♀) to 21 (♂) transverse series, in the middle of the back, correspond to the length of the head, 2, or 2 and 3 series, on the sides, correspond to a ventral plate.

* In a number of specimens from Brussels, Höllsteig, and Schneeberg I count 16–33, 15–25, and 11–25 respectively.

† Females from Clare Id., Sweden, St. Peter, Carniola, and Brosteni; in a few other cases the contact between the parietal and the postocular is very slight.

‡ Male from Bondy.

§ Only two instead of the normal three in females from Lhanbryde, Cappagh, Macroon, Kerry, and Killarney; on one side in a male and a female from Clare Id., females from Roundstone and Greystone.

‖ Perfectly distinct in males from Thetford, Graique, Sinaia, Esthonia, and Padun, in females from Leggs, Sepirton, Cappagh, Hindhead, Fowey, Liraan, Dambovita, and Kirghiz Steppes.

¶ Males from Borgo and Moscow, females from St. Peter, Carniola.

** Males and females from West Ross-shire, Kerry, Clare Id., and Sachalien (Anderson), female from Fowey. The other extreme (scales sharply keeled) in a male from Borgo.

†† Fatio's statement as to a difference in the shape of the scales, characterising the sexes, is not borne out by the material before me. It strikes me also as remarkable that not a word is said about keels on the scales in that author's detailed description. Was this omission intentional or accidental? Barbier (l.c.) denies the presence of keels in specimens from Normandy.

Ventral plates in 6 or 8* longitudinal series, those of the outer series, when 8 are present, smaller than those next to them; the plates of the second series from the median line always much broader than those of the first and usually broader than those of the third; those of the first usually narrower but sometimes as broad as those of the third; 23 to 26, rarely 21 or 27, transverse series in males, 26 to 30, rarely 24, 25, or 31, in females.

Preanal shield small, sometimes large, bordered by 2, rarely 1,† semicircles of smaller shields, 4 or 6, rarely 8, in the inner semicircle, the median pair usually enlarged.

Scales on upper surface of tibia more or less strongly keeled, sometimes nearly smooth, much smaller than dorsals. 5 to 15 femoral pores on each side, usually 8 to 12. 14 to 20 lamellar scales under the fourth toe, usually 15 to 19.

Caudal scales forming whorls which are more or less distinctly longer and shorter alternately; the upper strongly keeled, often grooved on each side of the keel, and ending in a point, the lower smooth in the basal part of the tail and rounded or obliquely pointed behind; 22 to 30 scales in the fourth or fifth whorl behind the post-anal granules.

The new-born young have often been described as black, and they do often appear so at first sight. It may be that some are really entirely black, but all those I have examined are only of a very dark bronzy brown above and greyish black beneath, the upper parts showing in a strong light—and better still after having been somewhat bleached in spirit—black and yellowish markings which are not essentially different from those of older specimens. I will here note the principal variations I have observed.

a. (Bozau, Transylvania.) A black, light-edged vertebral streak on the nape and on each side a light, black-edged streak proceeding from the outer edge of the parietal; on the back the black vertebral streak disappears and the light black-edged dorso-lateral streaks are broken up; they are replaced by four series of round ocellar spots which are continued on the tail. Two light, black-edged streaks on each side of the head, the upper from the eye to above the tympanum, the lower from the upper lip to the lower part of the tympanum;

* The distinction between 6 and 8 is often very arbitrary; 8 occurs more frequently in females than in males, but there is no correlation between the number of rows and the habitat, as believed by Bedriaga, any more than there is in the shape and size of the dorsal scales. I have never come across 10 series, as observed by Bedriaga in a specimen from Sachalien.

† Male from W. Ross-shire, females from Lhanbryde and Castleton.—In some other specimens the outer row is incomplete.

these streaks are continued, in the form of series of ocelli, on the neck and body, the upper ending above the hind limb, the lower passing above the fore limb and ending on the thigh, reappearing on the tail; also a series of small light spots along each side of the belly. Upper surface of head freckled with black. Upper surface of limbs with numerous round light spots.

b. (Ostend, 4 young from a mother handsomely striated.) The black vertebral streak is continued all along the back, and the light dorso-lateral streak is not broken up until reaching the middle of the body; only the upper labial streak is distinct on the side of the head and the light spots on the sides are less distinct, although following the arrangement described in *a*.

c. (Brussels, 6 young, mother with mere traces of a dark vertebral streak.) No dark or light streaks, but 10 longitudinal series of ocelli along the body, corresponding in position with those described under *a*.

d. (Luchon, Pyrenees.) A black vertebral streak and a rather faint light dorso-lateral streak ; no spots.

e. (Ringwood, Hants, 5 young, mother rather faintly striated.) One corresponds to *c*, with the addition of a dark median streak on the nape ; the four others are as in *d*.

The upper parts in the adult are usually of a lighter or darker brown, with yellow and dark brown or black markings; sometimes they are of a pale yellow, or grey, or greyish olive, with brown or reddish markings, or of a dark grey to black (*L. nigra*, Sturm). The light markings never form more than 8 longitudinal series. The females are usually streaked—a dark vertebral streak, often edged with yellow or bordered by dark ocelli with light centres, and a broader dark band, also often edged above and below with yellow, on each side from the nostril through the eye to the tail, passing above the hind limb; sometimes the dark vertebral streak disappears, and there are 4 longitudinal series of ocellar spots on the back; dark spots may be present between the bands, and a series of round light spots may run along the lateral bands. Males are sometimes striated like the females, but the vertebral streak is more often broken up into spots, bordered by small yellow dark-edged spots, and the lateral streaks are usually replaced by series of yellow, brown or black-edged ocelli. The upper surface of the head is often uniform, sometimes with round dark spots or with dark markings forming a curved band on the supraocular region, as is frequent in *L. agilis*.

Although often very similar to, or even identical, in colour and markings, with the typical form of *L. muralis*, *L. vivipara* never assumes a

reticulated pattern. The lower parts, with the exception of the throat, which is usually bluish or lilac, vary, in the males, from bright yellow to orange or red,* with black dots or small round black spots ; in the females they are pale yellow or pale orange, usually uniform, sometimes with scattered black dots ; an aberrant female from Limpsfield, Surrey, has large irregular blackish grey blotches on the throat and belly.†

To conclude this account of the coloration, notes are added on the upper parts of a few individuals, which depart from the more normal described above.

a. (Female from Scotland.) Four light dorsal streaks separated by black streaks of equal width ; two black streaks on the temple, continued on the neck, and fusing to a broad band, with a series of small light spots, on the body.

b. (Female from St. Peter, Carniola.) Nape normal; back with irregular black spots and a dorso-lateral series of very large ocellar spots, 8 in number, suggestive of *L. agilis* ; another series of large ocelli, continuation of the upper labial streak, lower down on the side. Belly and lower surface of limbs and tail much spotted with black.

c. (Male from Moscow.) Brown, without spots, with a somewhat darker broad lateral band. Belly with few black spots. Females from the Alps and Jura, with effaced markings, have been named var. *pallida* by Fatio, and olive specimens without any markings constitute the var. *carniolica* of Werner. Uniform pale brown females, from Silesia, have been recorded by Milde (l. c.).

d. (Males from Bournemouth and Bloxworth.) With 8 longitudinal series of ocelli, which may show a tendency to arrange themselves in cross-bars.

e. (Male from Brussels, preserved in the Brussels Museum.) Purplish grey above (in spirit) without stripes but with small rusty red spots ; belly pinkish, spotted with rusty red.

f. Black or blackish specimens have long been known. Although

* In *L. muralis*, when the belly is orange or red, the lower surface of the head is also of the same colour.

† Many authors, from Milne Edwards downwards, speak of the lower parts as bluish or greenish white or even green. I believe, with Fatio, that this statement is in most cases based upon an examination of specimens that have been preserved in spirit, as it is the rule for the yellow or orange to turn to greenish or green under the influence of this fluid. This does not apply to Leydig's allusion to female specimens from Germany, in which the lower parts are simply whitish, and to males with bluish pearl-coloured belly. Such specimens I have never seen, either in England, in France, in Belgium or in Germany. Young specimens, however, may have the belly of a bluish grey.

more frequent in some localities than in others, they cannot be regarded as local races, they are mere individual cases of more or less perfect melanism, affecting both sexes though apparently more frequent in females than in males.* Some are really entirely black, others are only of a blackish grey showing more or less distinctly the darker and lighter markings.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.
From end of snout to vent .	55	54	46	73	63	62	58
„ „ fore limb	20	19	18	23	20	19	18
Length of head . . .	12	12	10·5	12	11	11	11
Width of head . . .	9	9	8	9	8	9	8
Depth of head . . .	7	7	6·5	8	6·5	7	6
Fore limb	18	17	16	18	16	18	15
Hind limb	25	23	21	25	23	25	20
Foot	15	14	12	14	13	13	11
Tail	108	96	85	105	87	100	75

1. ♂, Schneeberg, Lower Austria. 2. ♂, Bournemouth. 3. ♂, Brussels. 4. ♀, Co. Meath. 5. ♀, Bozau, Transylvania. 6. ♀, St. Peter, Carniola. 7. ♀, Boussers, Vaud.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
SCANDINAVIA:										
♂ Norway, **P.M.** . . .	56	33	8	25	9	15	8–9	17	1	3
♀ „ „ . . .	69	27	8	27	8	16	9–8	17	1	4–3
„ Sweden	51	32	8	28	7	17	11–10	17	1	3–4
DENMARK:										
♀ Jutland	65	30	6	28	9	15	10	19	1	4
♂ Denmark, **P.M.** . .	46	37	6	24	10	17	11–12	17	1	4
♀ „ „ . .	60	36	6	26	9	18	10	16	1	3–4
BRITISH ISLES:										
♂ Scotland	55	31	8	23	10	15	8–9	15	0	4
♀ „	55	30	8	28	9	17	9–8	16	0	3–4
„ „	52	29	8	28	10	16	9–8	15	1	4
„ „	48	30	6	27	9	14	7–8	15	0	3
♂ Lhanbryde, Morayshire .	43	35	6	24	9	15	9	14	2–1	4
„ „ „ .	41	27	6	24	9	14	9	16	2–1	4–3
♀ „ „ .	66	29	8	28	8	17	9	16	0	3
„ „ „ .	62	31	6	28	8	16	7	16	1	4
„ „ „ .	62	31	6	29	9	18	11–10	16	2–1	4–3
„ „ „ .	58	30	8	24	9	14	10–9	15	2–1	3

* The British Museum specimens are from Eastbourne (female), Corfe Castle, Dorset (male), Lioraan, Cantal (female), and Sachalien Id. (male and female).

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♂	W. Ross-shire	46	29	6	25	9	15	10–8	15	0	3
♀	,,	50	31	6	28	8	18	11–10	17	1	3–4
♂	Douglas, I. of Man	51	34	6	25	10	19	11–10	15	1	4
♀	,, ,,	58	30	6	29	9	19	9–8	16	1–2	4
,,	Rhyl, Flintshire	43	32	6	28	8	16	10–9	15	2	3–4
,,	Levisham, Yorks.	53	32	8	27	10	20	9–10	15	0	3
♂	Thetford, Norfolk	50	36	6	24	10	20	10	17	1–2	4
,,	Brighton, Sussex, **D.M.**	46	34	6	24	9	18	10	18	1	4
♀	Eastbourne, Sussex	38	37	6	30	9	19	9	15	2	4
,,	Limpsfield, Surrey	56	35	6	28	7	19	10–11	17	1	3–4
♂	Guildford ,,	48	32	6	24	9	16	10–11	15	0	3
♀	Hindhead ,,	64	35	6	29	9	19	10	16	2	4
♂	Petersfield, Hants	50	33	6	23	9	17	11–10	16	1	3
♀	Ringwood ,,	62	32	6	28	9	19	8	15	1	3–4
♂	Bloxworth ,,	52	32	6	26	10	14	11	16	1	5–4
,,	,, ,,	49	31	6	26	9	18	10	16	2	3
,,	Bournemouth ,,	54	32	6	25	11	18	9	18	1	4
,,	,, ,,	50	32	6	24	8	18	11–10	15	1	4
,,	,, ,,	50	33	6	25	10	16	10	15	0–½	3
,,	Poole Heath, Dorset	52	36	6	26	10	18	10–11	16	2	3
♀	,, ,,	60	36	6	28	9	20	12	18	1	4–3
♂	Corfe Castle ,,	50	31	6	27	9	16	10	15	0	4–3
,,	Fowey, Cornwall	53	31	6	24	7	18	9	19	1	4–3
,,	,, ,,	49	32	6	24	9	18	8–9	15	2	4
♀	,, ,,	64	32	6	26	9	16	10–9	15	1–2	4
,,	Leggs, Co. Farmanagh	55	30	6	28	9	15	10–9	15	0	3
,,	Sepirton, Co. Louth, **D.M.**	65	27	6	30	10	15	9–8	15	0–1	4
,,	Roundstone, Co. Mayo, **D.M.**	65	30	6	28	11	20	10 8	16	0	4–3
,,	,, **D.M.**	64	29	8	31	10	16	8	14	1	3
♂	Belmullet, Co. Mayo, **D.M.**	53	32	6	24	9	16	10	16	0–1	3–4
♀	,, ,, ,,	63	33	6	30	10	14	9–8	16	1	3–4
,,	Clare Island ,, ,,	67	29	6	29	9	14	9–8	15	0	4
,,	,, ,, ,,	56	29	8	31	8	14	8–9	16	½–0	3
,,	,, ,, ,,	54	30	6	25	9	16	9–10	16	0	4–3
,,	Achill Island ,, ,,	52	28	6	29	8	15	8–9	15	½–1	4
,,	Greystone, Co. Wicklow, **D.M.**	65	30	6	29	10	16	9 16	15	0	4
♂	Graique, Co. Kilkenny	54	33	6	23	9	16	8 7	15	0–1	3
♀	Cappagh, Co. Waterford, **D.M.**	63	27	8	30	10	15	10–9	15	1	3
,,	,, **D.M.**	62	27	8	27	10	15	8	15	1 0	4
,,	,, ,,	60	26	8	29	8	18	9	15	1	4
,,	Castleton, Co. Cork, **D.M.**	65	29	6	29	9	16	8–7	14	1	3–4
,,	Macroon ,, ,,	36	29	6	30	9	15	9 8	15	0	3
♂	Co. Kerry, **D.M.**	57	32	6	27	10	15	9	16	1	4
♀	,, ,,	62	36	6	28	9	15	9	16	2	4
,,	Killarney, Co. Kerry, **D.M.**	53	26	6	25	8	12	8	14	½	4

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
FRANCE:										
♀ St. Malo	57	34	6	28	9	16	10–9	15	0	4
♂ La Ferté Macé, Orne	52	34	6	26	8	19	11	16	1	4
„ Rambouillet, near Paris	51	33	8	24	8	18	10–12	18	1	4
„ Bondy, near Paris	52	36	6	25	10	17	11–12	16	1	4
„ Aube	44	36	6	23	9	18	14–13	16	1	4
„ „	44	37	6	25	9	19	11	16	1	4
„ Mont Dore	49	33	6	24	9	18	11–10	16	1	4–3
♀ „	57	32	6	27	9	16	9	15	1	4
„ La Bourboule, Puy-de-Dôme	64	32	8	28	8	15	11–10	17	1	4
„ „	63	32	6	25	8	16	9–10	16	1	4
„ „	61	30	8	28	9	15	9–10	15	1	4
„ „	53	30	8	28	8	18	9	18	1	4–3
„ Lioraan, Cantal	62	29	8	29	9	18	9–10	16	0–1	4
„ „ „	56	32	6	28	10	17	9–10	17	1	4
♂ Forêt de Lente, Drôme	53	32	8	23	8	16	10	18	1	4
♀ Mt. Belladone, Isère	68	31	6	30	10	17	10	18	1	3–4
♂ Bordeaux, **P.M.**	52	33	6	24	9	18	11–12	19	1	4
„ „	52	35	6	25	9	19	12	17	1	4
♀ Lac D'Oo, Pyrenees	57	32	6	28	8	18	9–11	15	1	3
„ „ „	56	32	6	28	10	18	12–11	20	0	3
BELGIUM:										
♀ Ostend	55	30	8	31	9	15	9	14	1	3
„ Heyst s. Mer.	61	31	6	30	9	19	13–12	18	1	4–5
„ „	57	33	6	30	8	17	9	15	1	4
♂ Brussels	46	36	6	24	9	19	10	15	1	4
„ „	44	33	6	24	10	19	11	15	2	3–4
„ „	42	35	6	23	9	16	11–12	17	0	4
„ „	40	34	6	23	8	17	11–9	18	1	4
♀ „	57	33	8	28	9	17	11	17	2	4
„ „	55	33	8	28	9	17	11–10	16	2–1	4
„ „	53	32	8	30	8	16	11–9	16	1	4
„ „	52	34	8	28	10	18	11	16	1	4
„ „	50	36	8	30	9	19	10	17	1	4
HOLLAND:										
♀ Bergen-op-Zoom	60	33	6	28	10	15	11–12	14	1	4
SWITZERLAND:										
♂ Rigi, **D.M.**	45	33	6	23	9	18	12–11	16	1	4
„ Boussers, Vaud.	50	34	8	26	9	18	11–10	17	1	4
„ „ „	50	35	6	25	9	16	11	18	1	3
„ „ „	47	36	6	24	9	17	11–12	16	1	4
„ „ „	45	34	6	24	10	18	11–10	16	1	4–3
♀ „ „	58	32	8	28	10	18	10	16	2–1	4
„ „ „	53	35	6	29	9	17	11	18	1–2	4
„ Val del Fain, near Pontresina, **D.M.**	56	28	8	28	9	18	10–9	17	1	4
GERMANY:										
♂ Höllsteig, Baden	57	32	6	24	9	18	10–11	15	1	4

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♂ Höllsteig, Baden	46	35	6	26	9	20	9–10	18	1	4
♂ „ „	60	30	8	28	10	15	10–8	15	1	3–4
„ „ „	58	32	8	27	8	14	9–10	16	1	4–3
„ „ „	57	33	8	27	9	15	9	18	1	4
„ „ „	51	31	8	28	10	16	9–11	16	2–1	4
♂ Saxony	57	37	6	24	10	18	11–9	17	1	4
♀ „	54	31	8	27	9	17	12–11	16	0	3
„ Berlin	60	35	6	30	10	20	11	18	1	4
„ „	59	34	6	26	9	16	10	19	0	4–3
„ „	57	35	6	29	9	17	11	19	1	4
AUSTRIA:										
♂ Schneeberg, Lower Austria	55	32	6	26	8	16	12	17	1	4
„ „ „	53	27	6	24	7	17	11	19	1	4
„ „ „	48	29	8	25	8	16	10	19	1	4
♀ „ „	57	27	8	29	9	16	11–10	17	0–1	4–3
„ „ „	57	28	6	28	8	14	9–10	18	0 1	4
„ „ „	55	25	8	28	10	17	11	19	1	3–4
„ „ „	47	29	8	27	9	17	12–10	18	½	4
♂ Unterberg „	45	35	6	23	8	15	8	17	1	5 4
CARNIOLA:										
♂ St. Peter	62	34	6	25	9	19	14 13	19	1	4
„ „	61	32	6	26	9	20	12	18	1	4
ITALY:										
♂ Borgo, S. Tyrol	53	37	6	23	9	20	14 15	20	1	4 3
ROUMANIA:										
♂ Bozau, Transylvania	52	30	8	25	9	16	12–13	18	1	4
♀ „ „	63	32	8	28	8	19	11	18	1	4
♂ Brosteni, Moldavia	52	29	6	24	7	18	13–12	16	1	4
„ „ „	50	33	6	25	10	18	12	16	1	3–4
♀ „ „	52	30	8	24	8	19	12	16	0–½	3
„ „ „	49	35	6	26	10	18	11–10	17	1	4
♂ Sinaia, Carpathians	54	30	6	23	7	18	10–11	16	1	3
„ „ „	48	32	6	24	7	19	12–13	15	1	3–4
♀ „ „	68	36	8	27	10	18	11–10	18	1	3 4
„ Dambovita „	61	28	8	27	8	17	10–11	18	1	3
„ „ „	55	33	6	27	9	17	11 10	16	1	3
RUSSIA:										
♂ Lapland	55	28	6	23	8	19	9	16	1	3–4
„ „	54	35	6	22	10	19	5 8	16	1	3
„ Solowitzki Id.	61	31	6	23	10	19	12	17	1	4
„ Esthonia	53	33	6	24	9	17	10–11	15	1	3
♀ „	56	33	8	26	10	18	11–12	17	1	4
„ Petrograd	50	31	6	26	9	18	11	17	1	4
„ „ **P.M.**	60	31	8	29	8	19	9	16	1 0	4
♂ Moscow	55	33	6	23	9	20	11–10	17	1	4
„ „	48	32	6	21	10	19	10–12	17	1	4
♀ Uralsk	60	32	6	30	11	17	11	16	1	4
♂ Kirghiz Steppes	50	30	6	24	9	19	11–10	14	1	4

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
♀	Kirghiz Steppes . .	59	35	6	26	9	22	12–10	15	1	3
♂	Padun, R. Angara . .	52	31	8	23	9	17	11–10	14	1	4
♀	Stanowyi Mts., E. Siberia	60	26	6	27	11	15	9	15	1	4
♂	Nicolawsk, Amoor . .	52	33	6	25	10	21	11–12	19	1	4
„	Korsakoff, Sachalien Id. .	51	33	6	24	10	19	10–11	17	1	3
♀	„ „ . .	59	30	6	27	10	18	7–8	15	1	4–3
„	„ „ . .	54	31	6	27	12	17	7	18	1	4
„	„ „ . .	41	30	8	27	12	20	10	?	1	3–4
♂	Sachalien Id. . . .	49	31	6	24	9	18	11–10	18	1	4
„	„ . . .	44	32	6	26	10	20	9–10	17	1	4
♀	„ . . .	58	31	6	26	9	21	6–8	16	1	4
„	„ . . .	54	31	6	28	10	19	7–5	16	1	4
„	„ . . .	44	33	6	27	9	17	8–9	17	1	4

1. Length from snout to vent (in millimetres). 2. Scales across middle of body. 3. Longitudinal series of ventral plates. 4. Transverse series of ventral plates. 5. Plates in collar. 6. Gular scales in straight median series. 7. Femoral pores (right and left if differing). 8. Lamellar scales under fourth toe. 9. Anterior loreal (right and left if differing). 10. Upper labials anterior to subocular (right and left if differing).

Distribution.—This species shares with *Vipera berus* and *Rana temporaria* the most northern distribution of all Palæarctic Reptiles and Batrachians. Except for the absence of the Viper from Ireland, these three species have roughly the same range, extending right across Europe and Asia, from the extreme North of Scotland and Lapland to the Amoor and the Island of Sachalien. The southern limit of its distribution embraces the South of France, including the Pyrenees, the continental part of Italy, Istria, Croatia, Bosnia, Herzegovina, Bulgaria, Moldavia, Southern Russia from Podolia to the European slope of the Caucasus and the Kirghiz Steppes, and from the latter to the Altai, Northern Mongolia, L. Baikal, the Amoor, and Sachalien. It attains the altitude of 2670 m. in the Pyrenees, 3000 m. in the Alps and in Bulgaria, 2100 m. in Bosnia, 2400 m. in the Transylvanian Alps. Generally distributed in the North, in woods, lanes, meadows, and on heaths, sand-hills and cliffs near the sea; in the South it is more local in the plains, being found principally in bogs, damp meadows, and rice-fields, or is restricted to altitudes of at least 800 m.

It is highly remarkable for a species with so wide a distribution, and living under such varied conditions of climate and soil, to show no definable geographical races; very variable in scaling and coloration, the differences which have been adduced in favour of the establishment of varieties are purely individual, as the large material on which the above description is based amply shows. The specimens which depart

most from the type are from Southern Tyrol and Carniola, the feebly serrated collar coupled with a high number of scales (32–37) and of femoral pores (12–15) approximating them to *L. muralis* var. *brevi-ceps*, in which the head and limbs are comparatively short and the number of scales (45–55) and femoral pores (13–16) low for the species.*

So far as is known at present, this is the only species of the family Lacertidæ which has adopted the mode of parturition whence its name is derived. As ovo-viviparous species occur alongside the oviparous in most large families of lizards (Geckonidae, Agamidæ, Iguanidæ, Anguidæ, Zonuridæ, Scincidæ, Chamæleontidæ) in warm and tropical countries, it cannot be argued that this mode of reproduction is the result of climatic conditions; but it has enabled the lizard to extend its range to a more northern latitude than any of its congeners. It is a suggestive fact that of the six Reptiles inhabiting Great Britain, the only three which occur in Scotland are ovo-viviparous.

12. LACERTA FRAASII.

Lacerta fraasii, Lehrs, Festschr. R. Hertwig, ii, p. 227, pl. xiv, figs. 1–3 (1910).

In form and proportions like *L. vivipara*. Hind limb reaching the wrist of the adpressed fore limb.

Rostral not touching the nostril; suture between the nasals short; frontonasal broader than long, as broad as the internarial space; frontal slightly shorter than its distance from the end of the snout, a little more than twice as long as its least width, a little broader in front than behind; parietals a little longer than broad, outer border convex, not touching the upper postocular, in contact with a large anterior and two or three small upper temporals; occipital rather large, somewhat shorter but broader than the interparietal. Four supraoculars, first very small, fourth a little larger; 5 superciliaries, first longest; 3–5 granules between the supraoculars and the superciliaries. A single postnasal, in contact with the frontonasal; a small detached shield ("scutum subnasale") between the nasal and the first upper labial; anterior loreal shorter than second; 4 upper labials anterior to the subocular, which is much narrower beneath than

* We may recall, for curiosity's sake, Milne Edwards' diagnosis in 1829 (t.c., p. 84), where the number of pores was given as one of the principal characters for the distinction of *L. vivipara* (*schreibersiana*) from *L. muralis*, viz. about 12 in the former and 18 to 25 in the latter.

above; temporal shields rather large, with a large masseteric and a distinct tympanic.

19 gular scales between the symphysis of the chin-shields and the median collar-plate; gular fold distinct; collar serrated, formed of 8 plates.

Scales large, roundish-hexagonal and smooth, slightly keeled towards the base of the tail, increasing in size towards the ventrals; 32 scales across the middle of the body; 2 or 3 series, on the sides, correspond to a ventral plate. Ventral plates in 6 longitudinal series, with an imperfectly developed outer series, and 32 transverse series.*

Preanal shield large, bordered by two semicircles of small shields, the median of the inner series transversely enlarged.

Scales on upper surface of tibia smooth, much smaller than the dorsals. 14–15 femoral pores.

Upper caudal scales very distinctly keeled, ending in an obtuse point.

Pale yellowish brown above, with a dorso-lateral series of whitish, dark brown-edged ocellar spots (15 or 16 to above the hind limb) and between them two series of similar but faintly marked spots; dark vertebral streak reduced to a few spots on the nape; a dark brown lateral band, enclosing 4 or 5 blue ocelli from above the shoulder; a whitish streak from below the eye to the shoulder. Whitish beneath, with a large blackish brown spot on each outer ventral shield.

Measurements (in millimetres):

From end of snout to vent	60
„ „ fore limb	20
Length of head	12
Width of head	8
Depth of head	6
Fore limb	17
Hind limb	26

The original description and photographic figures, on which the above account is based, were taken from a single female specimen obtained by Dr. Oscar Fraas in the Lebanon at an altitude of 1900 to 2000 metres.

In commenting on the affinities of this lizard, which he compares with *L. caucasica* and *L. derjugini*, Dr. Lehrs has not sufficiently insisted on its relationship to *L. vivipara*. There can be no question, in my opinion, that it is extremely closely related to the latter. With

* Perhaps the author counted as a series a pair of plates in front of the preanals, which I do not reckon as such.

the exception of the enlarged shield in front of the preanal* and the blue colour of the lateral ocelli, there is not a character which does not also occur in *L. vivipara*, although not actually in combination.† I attach no importance whatever to the "scutum subnasale."‡ The system of coloration agrees perfectly well with that of *L. vivipara*.§

More specimens are needed to show whether specific rank should be accorded to this form or whether it should not be regarded as a variety of *L. vivipara*.

13. LACERTA DERJUGINI.

Lacerta derjugini, Nikolsky, Ann. Mus. Zool. Ac. St. Pétersb. iii, 1898, p. 284, and Herp. Ross. p. 126, pl. i, fig. 5 (1905); Méhely, Ann. Mus. Hung. vii, 1909, p. 572, pl. xxi, figs. 3 and 4; Schreib. Herp. Eur., ed. 2, p. 395 (1912); Nikolsky, Herp. Cauc. p. 55 (1913); Tzarewsky, Trav. Soc. Nat. Petrogr. xliii, 4, 1914, p. 24.

Body moderately depressed. Head small, $1\frac{1}{5}$ times as long as broad, moderately depressed, its depth equal to the distance between the centre of the eye and the tympanum, its length $3\frac{2}{3}$ to $4\frac{1}{3}$ times in males, $4\frac{1}{3}$ to $5\frac{1}{3}$ times in females, in length to vent; cheeks feebly swollen; snout obtuse, shorter than posterior part of head. Pileus $1\frac{3}{4}$ to $1\frac{4}{5}$ times as long as broad. Limbs short, the hind limb reaching the elbow of the adpressed fore limb or the axil in males, the wrist in females. Foot as long as head or a little longer. Digits scarcely compressed. Tail thick, $1\frac{1}{2}$ to $1\frac{3}{4}$ times length of head and body.

Nostril pierced between three shields. Rostral not touching the nostril, forming a suture with the frontonasal, which is broader than long and a little broader than the internarial space; prefrontals usually in contact with each other‖; frontal hexagonal, not much

* As appears sometimes, as an individual departure from the normal, in *L. agilis* and the typical *L. muralis*. I have, however, not met with it in any of the numerous specimens of *L. vivipara* examined; there is occasionally an azygos anterior preanal, but then it is small.

† In a female from Berlin the interparietal and occipital are nearly in the same proportion to each other; in another from the same locality, with 3–2 granules between the supraoculars and the superciliaries, the parietal scarcely reaches the upper postocular and the frontal is broader anteriorly than posteriorly.

‡ Occurs occasionally in *L. agilis* and *L. vivipara* (male from Russian Lapland, females from Hindhead and Ostend, male and female from Korsakoff, Sachalien).

§ Especially of the females from damp localities in the Alps, as opposed to those from the plains of Switzerland, which Fatio (Vert. Suisse, iii, p. 86) compares to *L. agilis*.

‖ Separated by an azygos shield in a female from Borjom.

broader in front than behind, as long as or a little longer than its distance from the end of the snout, as broad as or a little broader than the supraoculars; occipital shorter but broader than the interparietal*; parietals with the outer border straight or emarginate in front, usually not touching the upper postocular. Supraoculars as in *L. vivipara*, second longer than third; 4 to 7 superciliaries, first largest; a series of 2 to 12 (usually 4 to 9) granules between the supraoculars and the superciliaries, the series sometimes complete. A single postnasal, sometimes not reaching the frontonasal; anterior loreal nearly as long as or shorter than the second; 3 to 4 upper labials anterior to the subocular. A large anterior upper temporal, usually in contact with the fourth supraocular; temporal scales rather large, with distinct masseteric and tympanic shields, the masseteric often very large and in contact with the upper temporal.

Pterygoid teeth absent.

17 to 21 gular scales between the symphysis of the chin-shields and the median collar-plate†; gular fold distinct. Collar strongly serrated, composed of 4 to 8 plates, rarely 11.

Dorsal scales large, elongate-hexagonal or rounded, smooth or feebly keeled, increasing in size towards the ventrals, 38 to 46 across the middle of the body‡; 2 or 3 scales on the sides correspond to a ventral plate. Ventral plates in 6 longitudinal series, those of the second series from the median line much broader than the others, and in 22 to 27 tranverse series, 22 to 26 in males, 23 to 27 in females; the posterior border of the transverse series feebly notched, sometimes very indistinctly. Preanal shield large, bordered by a single semicircle of 7 to 10 small shields, rarely by two.

Scales on upper surface of tibia feebly keeled, much smaller than dorsals. 6 to 12 femoral pores on each side. 21 to 25 lamellar scales under the fourth toe.

Caudal scales in alternately longer and shorter whorls, upper obtusely pointed and keeled, lower smooth in the basal part of the tail; 22 to 26 scales in the fourth or fifth whorl.

Greyish brown or coppery brown above, with or without small dark brown spots, and constantly with a dark brown lateral band, which may be light-edged above; sometimes a series of small dark spots along the vertebral line; an ocellar spot with light centre sometimes present above the shoulder§; a light streak from below the eye

* Sometimes only as broad, according to Méhely.

† 15 to 18 according to Nikolsky.

‡ Up to 53 according to Nikolsky.

§ According to Méhely.

or the tympanum to the side of the body, where it is broken up into a series of spots; a dark, light-edged band along each side of the tail. Lower parts greenish, greyish or reddish, spotted with black on the sides; males with blue spots on the ventral plates of the outer series.

Measurements (in millimetres):

	1.	2.	3.	4.
From end of snout to vent . . .	52	49	64	63
„ „ fore limb . .	20	19	20	20
Length of head	12	12	12	13
Width of head	8	8	8	9
Depth of head	6·5	6	6	7
Fore limb	17	17	19	18
Hind limb	27	25	27	27
Foot	14	12·5	15	14
Tail	—	—	97	—

1. ♂, Bakuriani. 2. ♂, Mechelripsch. 3. ♀, Mechelripsch. 4. ♀, Iasotchka.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
♂ Mechelripsch, Gov. Tscher-nomorskaja	49	40	22	8	19	10–11	24	10–9	4
♀ „	63	41	24	7	17	11	22	9	4
.. „	57	39	23	6	19	11	21	9–8	4
.. „	55	46	24	8	21	10	25	11	4
♂ Lagodechi	48	40	23	6	17	9–10	23	4–2	3
♀ Iasotchka, near Suchum, 400 m.	64	43	24	11	19	10–12	24	12	4
., Borjom	44	38	27	7	18	9	25	7–5	4
♂ Bakuriani, near Borjom, 1200 m.	52	41	22	7	20	10	26	8	4

Columns as on p. 139, but No. 8 referring to the number of granules between supraoculars and superciliaries, and No. 9 to the anterior upper labials.

Habitat.—Caucasus and Crimea.

I agree with Nikolsky in regarding *L. derjugini* as most nearly related to *L. vivipara*, from which it differs chiefly in the smaller scales (38–53 across the body, instead of 25–37), and the constant presence of granules between the supraoculars and the superciliaries. If I am right in considering the presence of a dark vertebral streak or series of spots as more primitive than its absence, I cannot follow Méhely's view that *L. derjugini* is derived from *L. muralis*, var. *caucasica*. On the other hand, whilst lepidosis and markings are in accordance with my principles for deriving this lizard directly from *L. vivipara*, the presence of two postfrontal bones is opposed to such

an assumption, and I therefore look upon *L. derjugini* and *L. vivipara* as probably independently derived from the same original stock, evolved out of the primitive form of *L. agilis*, the former approaching the typical *L. muralis* in another evolutionary series.

I am indebted to M. Nesterov for the specimens from Mechelripsch and to M. L. Lantz for the others.

14. LACERTA PRATICOLA.

Lacerta praticola, Eversm. N. Mém. Soc. Nat. Mosc. iii, 1834, p. 345, pl. xxx, fig. 2; Kessler, Tr. St. Petersb. Nat. Soc. viii, 1878, p. 156; Boettg. in Radde, Faun. Flor. Casp. Geb. p. 36 (1886); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 367; Bouleng. Cat. Liz. iii, p. 25 (1887); Boettg. Ber. Senck. Ges. 1892, p. 139; Méhely, Math. Nat. Ber. Ung. xii, 1894, p. 255; Bedriaga, Zool. Anz. 1895, p. 261; Méhely, Zool. Anz. 1895, p. 474; Kiritzescu, Bul. Soc. Sc. Bucur. x, 1901, p. 313; Nikolsky, Herp. Ross. p. 124 (1905); Lehrs, Festschr. R. Hertwig, ii, pl. xiv, fig. 7 (1910); Schreib. Herp. Eur., ed. 2, p. 508 (1912); Kowatcheff, Herp. Faun. Bulg. p. 29 (1912); Nikolsky, Herp. Caucas. p. 55 (1913); Tzarewsky, Trav. Soc. Nat. Petrogr. xliii, 4, 1914, p. 24; Lantz & Cyrén, Ann. & Mag. N. H. (9), iii, 1919, p. 28.

Lacerta vivipara, var. *stenolepis*, Nikolsky, Ann. Mus. Zool. Ac. St. Pétersb. xvi, 1911, p. 1, and Herp. Caucas. p. 54.

Lacerta praticola pontica, Lantz & Cyrén, t.c. p. 30.

Form intermediate between *L. vivipara* and *L. muralis typica*. Head small, $1\frac{2}{5}$ to $1\frac{1}{2}$ times as long as broad, its depth equal to the distance from the anterior corner of the eye to the tympanum, its length $3\frac{3}{4}$ to $4\frac{1}{3}$ times in length to vent in males, $4\frac{1}{2}$ to 5 times in females; snout obtuse, as long as or a little shorter than postorbital part of head; cheeks not swollen. Pileus $1\frac{3}{4}$ to 2 times as long as broad. Neck a little narrower than the head. The hind limb reaches the elbow or the axil in males, the wrist in females. Foot $1\frac{1}{6}$ to $1\frac{1}{3}$ times length of head. Digits scarcely compressed. Tail cylindrical, tapering from the base, $1\frac{1}{2}$ to nearly 2 times length of head and body.

Nostril pierced between three (exceptionally four) shields. Rostral not touching the nostril; suture between the nasals short or very short; frontonasal broader than long, broader than the internarial space; suture between the prefrontals usually very short,* sometimes

* Frontonasal in contact with the frontal in a female from Comana Forest.

replaced by a small azygos shield*; frontal as long as or slightly longer than its distance from the end of the snout, about twice as long as broad, hexagonal, often a little narrower behind than in front, its least width not or but slightly greater than that of the supraoculars; parietals $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, in contact with 2 or 3 temporals, not in contact with the upper postocular; occipital always shorter than the interparietal, sometimes broader; a small shield often intercalated between the interparietal and the occipital.† Four supraoculars, first very small and in contact with the second loreal, fourth larger than first but much shorter than third and in contact with the frontoparietal; 5 to 7 superciliaries, first usually longest, forming a vertical or slightly oblique suture with the second; a series of granules between the supraoculars and the superciliaries, sometimes complete,‡ sometimes reduced to three.§

The nasal sometimes forms a suture with the anterior loreal‖; postnasal usually single¶; anterior loreal nearly as long as second; 4 upper labials anterior to the subocular,** which is much narrower beneath than above. Two or three enlarged upper temporals, the first longest and in contact with the fourth supraocular; temporal scales small, with a usually large masseteric shield, which is in contact with the first upper temporal and the sixth upper labial or separated from without by one series of scales; tympanic shield always well developed.

Pterygoid teeth absent.

Gular scales increasing in size towards the collar, 15 to 19,†† between the symphysis of the chin-shields and the median collar-plate; gular

* In two males from Comana Forest.

† Méhely has attached too great an importance, as a specific character, to the presence of this additional shield, which he has observed in 48 out of 78 specimens from Transylvania. It is absent in the three Caucasian specimens seen by me, and in 6 out of the 9 from Roumania. Although present in the type described by Eversmann, it is absent in the 15 specimens from Caucasia examined by Kessler and Bedriaga. Another anomaly, noticed by Schreiber, is for the occipital to be separated from the interparietal by the parietals, which form a median suture.

‡ In 2 males from Sukhum Kale.

§ In a male from Herkulesbad.

‖ Male and young from Sukhum Kale.

¶ Two superposed postnasals in a male from Sukhum Kale and, on the left side, in a female from Comana Forest.

** 5 on the right side in a male from Sukhum Kale and in another from Comana Forest. Occasionally 3 according to Kessler.

†† 14 to 22 according to Lantz and Cyrén.

fold absent or very indistinct; collar serrated, sometimes feebly, composed of 5 to 8 plates.*

Scales round and convex on the nape, elongate-hexagonal or rhombic, strongly and diagonally keeled, and juxtaposed or subimbricate on the back, narrower on the vertebral line; smaller on the sides, though sometimes not more than in certain specimens of *L. vivipara*, and more feebly keeled than on the back; 35 to 40† scales across the middle of the body; 18 (♀) to 26 (♂) transverse series, in the middle of the back, correspond to the length of the head, 2 or 3 on the sides correspond to a ventral plate. Ventral plates in 6 longitudinal and 22 to 29 transverse series (22–27 in males, 27–29 in females)‡; the plates of the second series from the middle line broadest, those of the first and third equal or the latter the broader. Preanal shield large, bordered by a single semicircle of 8 to 10 small shields.

Scales on upper surface of tibia keeled, much smaller than dorsals. 9 to 13 femoral pores on each side,§ usually 10 to 12. 21 to 25 lamellar scales under the fourth toe. Caudal scales forming whorls which are more or less distinctly longer and shorter alternately; the upper strongly keeled and ending in a point, the lower smooth in the basal part and rounded behind; 20 to 24 scales in the fourth or fifth whorl.

Grey, pale brown, or pale olive-brown above, with a darker brown or reddish brown vertebral band, 4 to 6 scales wide, and a darker brown lateral band, often light-edged above and beneath, from the nostril, through the eye, to the base of the tail; back sometimes with small blackish brown spots, which may arrange themselves in a series or run into a streak on each side of the vertebral band; head brown or reddish brown above, with or without small dark brown dots; the light streak bordering the lateral band below sometimes very well marked, white, and edged with blackish, especially from below the eye to the shoulder and on the basal part of the tail; the dark vertebral stripe, broken up into spots on the tail, reappears on the regenerated organ. Throat white; belly greenish in males,‖ yellowish in females, unspotted. The coloration of the young does not differ from that of the adult.

* Up to 9 according to Méhely.

† 32 to 43 according to Lantz and Cyrén.

‡ 25–27 in males, 28–31 in females, according to Méhely.

§ Up to 14 according to Méhely. In a female from the Comana Forest a few smaller pores from a second series.

‖ Pea-green in some, according to Méhely.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From end of snout to vent	53	52	41	55	51
„ „ „ fore limb	19	19	16	18	17
Length of head	12	12	10	12	10
Width of head	8	8	6·5	8	7
Depth of head	7	7	5·5	7	6
Fore limb	15	16	14	16	15
Hind limb	26	27	22	24	22
Foot	15	16	12	14	13
Tail	—	93	77	—	—

1, 3. ♂, Sukhum Kale. 2. ♂, Comana Forest. 4. ♀, Comana Forest. 5. ♀, Herkulesbad.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.
♂ Sukhum Kale, Transcaucasia	53	38	25	6	15	10–9	24	10
„ „ „ „	41	36	25	6	16	10	22	11–10
„ Comana Forest, Vlasca, Roumania	52	35	25	7	19	12–13	23	7–4
„ „ „ „ „	50	39	24	8	17	12–11	23	5–4
„ „ „ „ „	47	37	25	8	17	11	22	4
„ „ „ „ „	47	40	23	5	18	12–11	25	6–5
„ „ „ „ „	45	38	22	7	18	12–13	21	5–4
„ „ „ „ „	37	35	27	7	15	10	22	7–6
„ „ „ „ „	37	36	24	8	19	12–11	23	5–3
♀ „ „ „ „	55	37	27	6	18	9–11	23	9–5
♂ Herkulesbad, Transylvania	47	37	24	8	16	11	23	6–7
„ „ „	45	37	24	7	16	9–10	24	3
♀ „ „	51	37	29	8	18	13–10	25	7–8

Table as in the preceding, minus column 9.

Habitat.—Cis- and Transcaucasia, and South Coast of the Caspian Sea; Valleys of the Southern Carpathians under 600 m. altitude. The species has recently been recorded from Bulgaria.

All the specimens in the British Museum* have 6 pairs of chin-shields, the 3 anterior forming a median suture, and are therefore referable to Lantz and Cyrén's subspecies *pontica*. The typical form, according to them, with 5 pairs of chin-shields, the 2 anterior forming a median suture,† is confined to the Caspian Sea basin, and is distinguished besides by rather smaller and more feebly keeled scales (35 to 43, usually 39, across middle of body).‡

* 15 in number.

† The authors mention, however, occasional exceptions (one in the case of each of the two forms) with 5 shields on one side and 6 on the other.

‡ The series in the British Museum does not support the authors' statement as to two other characters—the postnasal and the masseteric shield; all have

15. LACERTA VAUERESELLI.

Lacerta vauereselli, Tornier, Zool. Anz. xxv, 1902, p. 701; Sternfeld, in Schubotz, Wiss. Ergebn. Deutsch. Z.-Afr. Exped. iv, ii, p. 210, pl. vi, fig. 2 (1912), and Sitzb. Ges. Nat. Fr. Berl. 1912, p. 386; Schmidt, Bull. Amer. Mus. N. H. xxxix, 1919, p. 495, fig.

Head flat above, 4 times or a little less in length to vent in males, $4\frac{1}{3}$ to $4\frac{1}{2}$ times in females; snout short, obtuse. No parietal foramen. Hind limb reaching the collar in males, not so far in females. Tail about twice as long as head and body.

Rostral not entering the nostril. Nasals forming a suture behind the rostral; frontal a little shorter than its distance from the end of the snout, as long as the parietals or a little shorter or a little longer; interparietal and occipital small. Four supraoculars, first and fourth small; 5 or 6 superciliaries; an incomplete series of granules between the supraoculars and the superciliaries. A single postnasal. 4 or 5 upper labials anterior to the subocular. Temporal scales small or rather large, smooth or more or less distinctly keeled, 3 to 5 in contact with the parietal; tympanic shield usually present.

No pterygoid teeth.

20 to 25 gular scales in a longitudinal series in the middle; no gular fold. Collar serrated, formed of 6 to 11 plates.

Dorsal scales large, subimbricate, pointed behind, and keeled; lateral scales a little smaller; 38 to 50 scales across the body. Ventrals in 6 longitudinal and 19 to 21 transverse series. Preanal shield large, bordered by a single semicircle of smaller shields.

Scales on upper surface of tibia smaller than dorsals. 7 to 10 femoral pores on each side.

Upper caudal scales strongly keeled and pointed behind.

Upper surface of head and dorsal region (4 to 9 scales broad in the middle, its narrowest point) light, yellowish or olive, sides dark brown or reddish brown, edged with black above, with one or two series of white, black-edged ocellar spots; small dark spots on the back, which may form a vertebral series; sometimes a light streak from the cheek to the side of the neck, passing above the tympanum.

Belly bluish grey (in spirit), sometimes spotted with black in the male.

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the former in contact with the frontonasal, and 6 out of 15 have small scales between the latter and the supratemporal. The occipital is more often narrow than broad.

Measurements (in millimetres):	♂.	♂.	♀.
From end of snout to vent	45	53	57
Length of head	11·5	14	13
Width of head	6·5	—	—
Fore limb	18·5	22	22
Hind limb	29	30	30
Tail	85	102	173

Habitat.—Forest region of Central Africa, between Kagera and the Congo, Kwidjwi Island in Lake Kivu, and Ruanda, up to an altitude of 2400 m.

This species, which is only known to me from the descriptions and figure quoted above, has been regarded by Tornier as closely related to *L. jacksonii*, by Sternfeld as nearer to *L. vivipara*. I am inclined to agree with the latter author. It is a remarkable fact that, notwithstanding the great differences in form and coloration which separate them, the three tropical African species, *L. jacksonii*, *vauereselli*, and *echinata*, agree in the absence of the parietal foramen. Is this important morphological negative feature to be regarded as due to convergence, connected with climatic conditions, or does it indicate relationship? I am for the present in favour of the former hypothesis.

Section IV. Podarcis, Wagl.—Transverse series of ventral plates with rectilinear or nearly rectilinear border, longitudinal series 6 or 8 in number; femoral pores 12 to 31; toes more or less compressed, with 19 to 36 lamellar scales under the fourth.

A. Normally a single postnasal.*

1. Pterygoid teeth constantly or nearly constantly present.

An incomplete series of granules between the supraoculars and the superciliaries (rarely reduced to 2 to 5); collar serrated; dorsal scales usually diagonally keeled; caudal scales more or less pointed behind; 19 to 29 lamellæ under the fourth toe . . . . . *L. taurica*, Pall., p. 152.

Granules between the supraoculars and the superciliaries absent (rarely 1 to 3); collar not serrated; dorsal scales smooth or feebly keeled; caudal scales truncate or very obtusely pointed behind; 26 to 31 lamellæ under the fourth toe.

L. peloponnesiaca, Bibr., p. 159.

2. Pterygoid teeth absent, with rare exceptions; collar entire or feebly serrated, rarely strongly serrated.

A parietal foramen†; dorsal scales, if distinctly hexagonal and keeled, not larger than the laterals; ventral plates in 6 (exceptionally 8) longitudinal series . . *L. muralis*, Laur., p. 162.

* Exceptions rather frequent in *L. muralis*, var. *bedriagæ*.

† Indicated externally by an impression or a light dot in the centre of the interparietal shield.

A parietal foramen; dorsal scales more or less distinctly hexagonal and keeled, larger than the laterals; ventral plates in 6 longitudinal series; collar serrated; 27 to 32 lamellæ under the fourth toe . . . . . *L. chlorogaster*, Blgr., p. 292.

No parietal foramen; ventral plates in 8 longitudinal series; collar not or but slightly serrated; 22 to 26 lamellæ under the fourth toe . . . . . *L. jacksonii*, Blgr., p. 295.

B. Normally two superposed postnasals*; collar not or but feebly serrated.

1. Pterygoid teeth constantly or nearly constantly present.

Ventral plates in 8 longitudinal series; masseteric shield present; 50 to 55 scales across middle of body, smooth; 25 or 26 lamellæ under the fourth toe . . . *L. brandtii*, De Fil., p. 299.

Ventral plates in 6 (rarely 8) longitudinal series; masseteric shield large; 49 to 62 scales across middle of body, keeled; 27 to 35 lamellæ under the fourth toe . . . *L. lævis*, Gray, p. 302.

Ventral plates in 8 longitudinal series; temple covered with minute granules, which are smaller than the dorsal scales; 85 to 95 scales across middle of body, smooth or faintly keeled; 29 or 30 lamellæ under the fourth toe *L. jayakari*, Blgr., p. 307.

2. Pterygoid teeth absent, with rare exceptions.

a. A large upper temporal.

52 to 66 scales across middle of body; median subcaudal scales not enlarged; 27 to 32 lamellæ under the fourth toe.

L. danfordii, Gthr., p. 309.

59 to 75 scales across middle of body; median subcaudal scales strongly enlarged, the largest at least twice as broad as long; 22 to 26 lamellæ under the fourth toe.

L. oxycephala, D. & B., p. 319.

36 to 45 scales across middle of body; median subcaudal scales feebly enlarged; 22 to 25 lamellæ under the fourth toe.

L. mosorensis, Kolomb., p. 323.

b. Upper temporal and masseteric shields absent; 54 to 81 scales across middle of body.

L. dugesii, M.-Edw., p. 327.

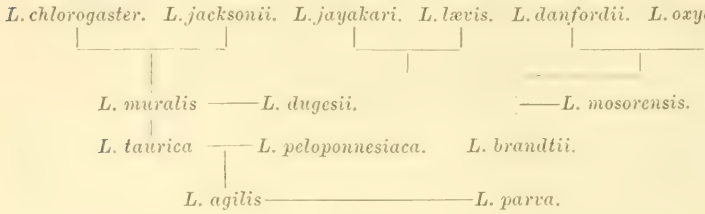
Two postfrontal bones are present in the young of all the species of this section, so far as they have been examined, but they have been observed to fuse to one in adult specimens of *L. muralis*, vars. *campestris* and *albiventris*, *L. jacksonii*, *L. lævis* and *L. dugesii*.

The division of this Section into two groups, according to the presence of one or of two postnasal shields, is merely for convenience.†

* Exceptions rather frequent in *L. mosorensis*.

† As stated in the Introduction, p. 31, I take the single postnasal to be the more primitive; but although the division of the shield into two has become fixed in the forms which I regard as evolved out of *L. parva*, I believe that a reversion by fusion to a single shield may have taken place in this case, as the tendency in *L. mosorensis* shows.

It does not express the true relationships, as I regard *L. dugesii* as more nearly related to *L. muralis* than to the species with which it is associated in this key. To remove the difficulties imposed by the necessity of a serial arrangement, and to convey the affinities as I conceive them, the following diagram has been drawn up:



16. LACERTA TAURICA.

Lacerta taurica, Pallas, Zoogr. Ross.-As. iii, p. 30 (1811); Rathke, Mém. Sav. Etr. Ac. St. Pétersb. iii, 1837, p. 302, pl. ii, figs. 1–4; Demidoff, Voy. Russ. Mér. iii, p. 337, pl. i, figs. 1, 2 (1842); Kessler, Tr. St. Petersb. Nat. Soc. viii, 1878, p. 163; Bouleng. Proc. Zool. Soc. 1881, p. 740; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 320, pl. —, fig. 28; Bouleng. Cat. Liz. iii, p. 26 (1887); Werner, Wiss. Mitth. Bosn. Herzeg. vi, 1899, p. 833; Kiritzescu, Bull. Soc. Sc. Bucur. x, 1901, p. 314; Méhely, Allat. Köslem. i, 1902, p. 58; Lehrs, Zool. Anz. 1902, p. 231; Nikolsky, Herp. Ross. p. 127 (1905); Bouleng. Proc. Zool. Soc. 1907, p. 557, pl. xxx; Schreib. Herp. Eur., ed. 2, p. 439, fig. (1912); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 41, pl. iii, figs. 1–6.

Lacerta taurica, part., Dum. & Bibr. Erp. Gén. v, p. 225 (1839); Schreib. Herp. Eur. p. 419 (1875).

Podareis taurica, Bonap. Icon. Faun. Ital., Amf. (1836).

Zootoca taurica, part., Gray, Cat. Liz, p. 29 (1845).

Podareis taurica, part., De Betta, Rett. Anf. Grec. p. 35 (1868).

Lacerta muralis neapolitana, part., Bedriaga, Bull. Soc. Nat. Mosc. 1881, p. 99, and Abh. Senck. Ges. xiv, 1886, p. 220.

Lacerta peloponnesiaca (non Bibr.), Werner, Verh. Zool.-bot. Ges. Wien, xliv, 1894, p. 228, and Zool. Anz. 1895, p. 470.

Lacerta muralis (non Laur.), Boettg. Ber. Senck. Ges. 1889, p. 270.

Lacerta ionica, Lehrs, Zool. Anz. 1902, p. 232; Schreib. op. cit., ed. 2, p. 436, fig.

Head rather small, 4 to $4\frac{1}{3}$ times in length to vent in males, $4\frac{1}{4}$ to $4\frac{2}{3}$ in females, as deep as broad or not much broader than deep, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, exceptionally $1\frac{3}{4}$ times*; occipital region

* In a male from Nision, Morea.

convex; the depth of the head, in the tympanic region, equal to or a little greater than the distance between the anterior corner of the eye and the anterior border of the tympanum; snout obtusely pointed, with straight or slightly convex upper profile, as long as the distance between the eye and the tympanum. Neck as broad as the head, or a little narrower or a little broader. Body feebly or moderately depressed. Hind limb reaching the axil, the shoulder, or the collar in males, the wrist or the elbow of the adpressed fore limb in females; foot as long as the head or a little longer (not more than $1\frac{1}{4}$ times); toes feebly compressed. Tail cylindrical, $1\frac{1}{2}$ to slightly over 2 times the length of head and body.

Nostril pierced between the nasal, a postnasal, the first upper labial, and nearly always the rostral*; frontonasal much broader than long†; frontal as long as or shorter than its distance from the end of the snout, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, nearly as broad, behind, as the major supraoculars; parietals $1\frac{1}{4}$ to $1\frac{1}{3}$ times as long as broad, with straight or convex outer border, nearly always in contact with the upper postocular‡; occipital very variable in shape, usually shorter than the intraparietal,§ sometimes fused with it or separated from it by a small shield. Major supraoculars equal or first a little the longer; 5 or 6 superciliaries, first or second longest, the suture between the first and second usually oblique, sometimes vertical; an incomplete series of granules between the supraoculars and the superciliaries, the first superciliary being constantly in contact with the second supraocular, the granules sometimes minute or reduced to 2 to 5.‖ Rostral entering the nostril, often largely¶; postnasal single**; 2 loreals, first much shorter than second; 4 upper labials anterior to the subocular,†† the lower border of which is shorter than the upper. Scutellation of the temple very variable, the two extremes

* In a female from Nision the frontonasal forms a suture with the rostral; in a male from Cephalonia the nasal is in contact with the anterior loreal, above the postnasal.

† Longitudinally bisected in a female from Budapest, broken up into four shields in a female from Bazias.

‡ Except in a male from Budapest—Franzstadt.

§ As long as the interparietal in a few specimens from Greece and the Ionian Islands.

‖ In specimens from Crimea, Bulgaria, Hungary, Cephalonia and Corfu.

¶ I have observed only two exceptions (female from Tzabadka and female from Corfu), in which the nostril is narrowly separated from the rostral.

** Two superposed postnasals in a male from Nision.

†† 5 on one side in a male and in a female from Budapest, in a female from Szabadka and in another from Rutshuk; three on each side in a male from Cephalonia.

approaching *L. agilis* and *L. muralis*, var. *campestris* respectively; masseteric and tympanic shields usually distinct, the former sometimes very large and in contact with the upper temporals, of which there are usually 2 or 3.* Pterygoid teeth nearly always present.

19 to 28 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold always well marked. Collar formed of 8 to 12 plates (usually 9 to 11), the edge more or less distinctly serrated.

Scales on body juxtaposed, oval or oval-hexagonal, very small and more or less diagonally keeled on the back, larger and smooth or very feebly keeled towards the ventrals. Exceptionally the scales on the back may be almost perfectly round granules, with a feeble straight keel† or even almost without a trace of a keel.‡ In a male from Rakos, Hungary, which has very strongly keeled dorsal scales, and in another from Corfu, the scales on the flanks, right down to the ventral plates, show a feeble yet distinct keel. The number of scales across the body varies from 42 to 62§; on the flanks, 3 or alternately 2 and 3 series of scales correspond to a ventral plate; 36 to 50 scales, in the middle of the back, correspond to the length of the head. Ventral plates in 6, exceptionally 8‖ longitudinal and 25 to 32 transverse series (25 to 29 in males, 25 to 32 in females); the plates of the second series from the median line usually much broader than the others. Preanal plate moderately large or rather small, with 2 or 3 semicircles of small plates or scales, one or two of the median plates of the inner semicircle sometimes considerably enlarged.

Scales on upper surface of tibia usually smaller than dorsals, more or less distinctly keeled. 19 to 29 lamellar scales under the fourth toe. Femoral pores 14 to 20 (usually 15 to 19) in the typical form,¶ 15 to 25 (usually 18 to 21) in the specimens from Greece and the Ionian Islands (var. *ionica*).

Caudal scales oblique, more or less obtusely pointed behind, the upper strongly keeled, the lower smooth or feebly keeled; the whorls subequal in length; 30 to 37 scales in the fourth or fifth whorl behind the postanal granules.

This species has been divided into two, *L. taurica*, from the countries

* Only one in a male from Tzabadka and in two from Budapest.

† Females from Crimea and Tzabadka.

‡ Female from Rutshuk.

§ 42 is exceptional and occurs only in one female from L. Stymphalos, two males from the same locality having 50 and 55 respectively.

‖ In a male from Greci, in a male from Constantinople, in a female from Bazias, and in a male from Tyrias-Mykena.

¶ 15 to 22 according to Kessler.

bordering the north and west of the Black Sea, extending westwards to Macedonia and Budapest, and *L. ionica*, from Greece and the Ionian Islands. Although the extremes are rather different in form and coloration, they are so completely linked as to render a good definition of *L. ionica* impossible, and I have therefore reduced the latter to the rank of variety, characterized, in its most accentuated form, by a rather longer head with less convex snout, rather longer hind limbs, more numerous femoral pores, and especially by the coloration. As I regard the Greek-Ionian lizard, in which a vertebral series of black spots sometimes persists, as the more primitive, its coloration is here dealt with first.

Green on the head and neck and on the back, brown on the sides of the body, with a more or less distinct light streak along each side of the back, usually with black spots above and below it, these spots sometimes large, more usually small; a vertebral series of small black spots occasionally present; a more or less distinct ocellar spot with blue centre sometimes present above the shoulder; a pale brown or golden colour forms spots or a band on each side of the posterior part of the body and on the base of the tail; a more or less distinct light streak from below the eye to the thigh; fore limbs green, hind limbs and tail brownish grey with light spots. Some specimens are unspotted (var. *olivicolor*, Schreiber), uniform green, with the sides of the body partly or entirely reddish brown, or green above and olive-brown on the sides, with a whitish dorsolateral line. Belly greenish or yellowish white, or pale yellow, with pale blue spots on the outer ventral plates, which may also bear small black spots.

In the typical form a brown shade predominates on the upper parts, with the exception of a more or less broad vertebral stripe, which is of a more or less bright green; a light streak may extend from the outer border of the parietal shield to the base of the tail and another from below the eye to the groin; the sides of the body outside the green area are more or less spotted or marbled with black, and the black spots may extend across or over the light dorsolateral streaks, which often entirely disappear, especially in males; a few black spots may be present in the middle of the green area on the nape. In some specimens* the black markings predominate over the ground-colour and enclose small whitish spots, whilst in others they are large and few, forming two or three regular series on each side of the body, or small and numerous, or with the upper series confluent into a wavy line bordering inwards the light dorsolateral streak†; in the latter case

* Males from Hungary.

† Male from Roumania.

the green dorsal area is much broadened, and such specimens approach the var. *ionica*. The lower parts are white, yellow, or deep orange, without spots or with small black spots on the sides; pale blue spots are present on the outer ventral plates and just above them. The dark and light spots on the tail combine to form a more or less distinct but ill-defined striation.

In its markings the typical form is often very suggestive of certain specimens of *L. viridis* (so-called var. *bilineata*).

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.
From end of snout to vent	80	77	68	68	63	61
,, ,, ,, fore limb	29	27	26	24	22	22
Head	20	18	16	15	14	14
Width of head	13	11	10	9	9	8
Depth of head	12	11	9	8	8	8
Fore limb	26	23	20	20	19	17
Hind limb	43	39	33	31	30	27
Foot	22	20	18	16	16	14
Tail	150	136	120	105	105	90

1. ♂, Nision. 2. ♂, Corfu. 3. ♂, Roumania. 4. ♀, Nision. 5. ♀, L. Stymphalos. 6. ♀, Rakos.

Particulars of Specimens Examined.

Forma typica.	1.	2.	3.	4.	5.	6.	7.
♂ Taurida, **P.M.***	71	59	27	9	23	20	25
,, ,, ,,	55	60	28	11	25	19	25
♀ Crimea	63	54	30	9	23	20–19	27
,, Bakal, Crimea	54	49	32	9	22	17	24
,, Sebastopol	59	51	30	9	23	17	24
,, ,,	47	48	31	9	20	18–17	25
♂ Roumania	68	52	29	11	24	16–15	24
,, Dobrudja, Roumania	67	50	26	9	21	18	27
,, ,, ,,	62	48	27	8	20	19–18	26
♀ ,, ,,	60	50	31	8	20	18	26
,, ,, ,,	55	55	31	11	25	17–18	24
♂ Greci, Roumania	48	48	26	11	20	19–18	24
♀ Rutshuk, Bulgaria	54	51	31	10	25	19–17	25
,, ,, ,,	54	52	28	11	21	18	26
♂ Constantinople	56	53	27	10	24	20–19	25
,, Salonica	54	55	29	9	24	17–18	25

* These specimens, received from Demidoff, were referred by Duméril and Bibron to *L. viridis*, var. E.

	1.	2.	3.	4.	5.	6.	7.
♂ Salonica	52	57	28	9	22	17 16	22
„ „	52	56	28	9	21	18	24
♀ „	52	55	29	9	21	18	23
♂ Bazias, S. Hungary	59	55	28	10	23	17	26
♀ „ „	59	51	29	10	22	17–16	25
♂ Tzabadka, Budapest	55	50	26	8	22	17–18	23
♀ „ „	55	51	30	9	21	16	22
♂ Budapest	63	49	27	9	20	16	24
„ „	63	53	26	9	23	16–15	19
„ „	60	51	26	10	21	17–15	23
„ „	60	55	27	10	20	16–17	23
„ „	51	52	26	9	24	16–18	24
„ „	48	54	27	10	21	17–16	23
♀ „	53	53	30	10	20	15–14	21
„ „	53	46	29	11	22	15–16	?
„ „	53	45	30	10	21	16	20
„ „	48	49	30	9	23	16	22
♂ Budapest-Franzstadt	64	49	27	9	23	15–16	23
♀ „ „	57	47	30	10	23	16–17	23
♂ Rakos, near Budapest	62	50	27	10	21	15	22
♀ „ „	61	49	30	9	22	15–16	23
Var. ionica.							
♂ Prevesa, Epirus*	65	55	28	10	26	21	27
♀ „ „	65	55	32	10	20	18–19	23
♂ Tyrins to Mikena, Morea	69	57	28	10	21	19–20	23
♀ „ „	63	56	32	8	21	18	25
♂ L. Stymphalos, Morea	64	50	26	9	23	21–20	26
„ „ „	58	55	26	9	21	18–17	25
♀ „ „	63	42	31	9	19	17–18	24
♂ Nision, Morea	80	59	28	11	25	20–21	29
„ „ „	75	54	27	9	22	19–20	27
„ „ „	70	60	28	11	20	20	26
♀ „ „	68	57	31	9	22	20	25
„ „ „	66	61	31	9	23	20–21	25
♂ Morea, **P.M.**	68	62	26	10	22	20	26
♀ „ „	69	54	31	8	22	20–21	24
„ „ „	69	50	26	10	19	17 18	24
„ „ „	62	55	30	11	21	21	26
♂ Cephalonia	70	60	27	9	28	23–25	25

* Preserved in the Senckenberg Museum. *Cf.* Boulenger, Tr. Z. S., xx. 1913, p. 164.

	1.	2.	3.	4.	5.	6.	7.
♂ Cephalonia	63	58	29	10	21	24–25	24
,, ,,	63	59	27	9	24	20	26
♀ ,,	67	59	31	11	25	23–22	28
,, ,,	66	55	32	10	22	22–23	29
,, ,,	56	60	29	9	24	21–22	27
♂ Corfu	77	60	27	12	23	20	25
,, ,,	70	56	28	9	23	21–22	27
,, ,,	67	59	28	10	22	21–19	28
,, ,,	67	57	28	9	21	19–18	25
,, ,,	67	53	26	11	21	21	25
,, ,,	67	55	26	9	23	20–19	24
,, ,,	65	57	28	9	23	21	25
,, ,,	65	53	26	10	21	18	25
,, ,,	63	52	25	12	22	18–16	24
,, ,,	63	57	27	11	23	21	26
,, ,,	63	52	26	9	22	19	25
,, ,,	60	60	25	10	22	19–20	26
♀ ,,	65	54	31	12	25	19	25
,, ,,	62	53	29	10	20	17–18	26
,, ,,	62	59	30	11	22	20–18	22
,, ,,	57	56	25	10	21	15–16	25
,, ,,	52	53	28	10	22	17–15	25

1. Length (in millimetres) from snout to vent. 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of plates in collar. 5. Number of scales and granules between symphysis of chin-shields and median collar-plate. 6. Number of femoral pores (on right and left sides, if differing). 7. Number of lamellæ under fourth toe.

Habitat.—Crimea and the North Coast of the Black Sea, Roumania, Bulgaria, Turkey in Europe, Serbia, Hungary, Greece and Ionian Islands. A specimen stated to be from the Caucasus (Darial Gorge, coll. Chantre, 1879) is preserved in the Lyons Museum.

I regard *Lacerta taurica* as one of the most primitive species of the *L. muralis* group, owing to its palatal dentition, short head, serrated collar, often hexagonal and keeled dorsal scales, more or less pointed caudal scales, etc. The var. *ionica* connects it with *Lacerta muralis*, vars. *campestris* and *fiumana*.

If I am right in regarding a dark vertebral stripe or series of spots as a primitive character, the typical *L. taurica*, in which it is always absent, or merely represented by a few spots on the nape,*

* In accordance to the theory of Eimer that the evolution of markings proceeds from back to front.

would be derived from the var. *ionica*, in which it is sometimes present. As I have observed above, the brown colour is more primitive than the green, and the young *L. agilis* and *L. taurica* show no green; but whereas in the evolution of *L. agilis* the green colour appears first on the sides, before invading the back, the reverse obtains in *L. taurica* and *L. muralis*.

17. LACERTA PELOPONNESIACA.

Lacerta peloponnesiaca, Bibr. in Bory de St. Vinc. Exped. Sc. Morée, Rept. p. 66, pl. x, fig. 4 (1835); Bedriaga, Zool. Anz. 1883, p. 216, and Abh. Senck. Ges. xiv, 1886, p. 331, pl. —, fig. 13; Bouleng. Cat. Liz. iii, p. 27 (1887); Werner, Wiss. Mitth. Bosn. Herzog. vi, 1899, p. 832; Bouleng. Proc. Zool. Soc. 1911, p. 37, fig., pl. i; Schreib. Herp. Eur., ed. 2, p. 459, fig. (1912); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 48, pl. iii, figs. 7–9.

Lacerta muralis (non Laur.), Bibr. l.c. figs. 2, 3.

Lacerta taurica, part., Dum. & Bibr. Erp. Gén. v, p. 225 (1839); Schreib. Herp. Eur. p. 419 (1875).

Podarcis taurica, part., De Betta, Rett. Anf. Grec. p. 35 (1868).

Lacerta taurica, vars. *peloponnesiaca*, *rathkei*, *maculata*, Bedriaga, Bull. Soc. Nat. Mosc. 1881, p. 83.

In shape and general proportions not unlike *L. taurica*, but head usually larger and limbs rather longer. Head large (usually not 4 times in length to vent in males), feebly depressed; snout sometimes very obtuse, sometimes very pointed, as long as the distance between the eye and the ear-opening; preocular region rather deeply concave. Neck as broad as the head, or a little broader. Foot always longer than the head. Hind limb reaching the collar or between the collar and the ear-opening in the male, the elbow or the axil in the female. Tail cylindrical, twice as long as head and body or a little shorter or a little longer.

Nostril pierced between the nasal, the postnasal, the first upper labial, and the rostral. Nasals forming a short or very short suture behind the rostral*; frontonasal as long as broad or broader than long; frontal not longer than frontoparietals, anterior borders very concave, meeting at an acute angle, the shield often appearing trilobate with long median lobe in front, in adult male specimens; parietals about once and a half as long as broad, in contact with the upper postocular, outer border convex; occipital very variable in size,

* In two specimens the frontonasal forms a narrow suture with the rostral; similar exceptions have been pointed out by Werner, l.c.

sometimes longer, sometimes shorter, and usually broader than the interparietal, from which it may be separated* by a short suture formed by the parietals. Supraoculars in contact with the superciliaries, rarely one to three granules intervening between them; the second usually a little longer than the third, both broader than the posterior part of the frontal; 5 or 6 (rarely 4) superciliaries, first or second usually longest, the suture between the first and second usually oblique, sometimes vertical.

Rostral largely entering the nostril; postnasal single†; two loreals, first much shorter than second. 4 or 5 upper labials anterior to the subocular,‡ the lower border of which is much shorter than the upper. Usually rather large, irregular shields cover the temple, often exactly as in *L. viridis*; sometimes the temporal lepidosis is as small as in an average *L. muralis*; a more or less distinct masseteric shield; tympanic shield distinct, sometimes small; a more or less enlarged upper temporal anteriorly, followed by 3 or 4 smaller shields.

Pterygoid teeth strongly developed.

28 to 34 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold distinct; collar with even edge, composed of 9 to 12 plates.§

Scales on back juxtaposed, granular, round, suboval, or subhexagonal, smooth or feebly or faintly keeled, on flanks towards the ventrals larger, flat and subimbricate, smooth; 53 to 65 scales across the middle of the body, 2 and 3 or 3 and 4 transverse series, on the sides, corresponding to a ventral plate, 48 to 60 in the middle of the back corresponding to the length of the head. Ventral plates in 6 longitudinal series, subequal or the second series from the middle line the broadest; 28 to 33 transverse series (28 to 30 in males, 31 to 33 in females). Preanal plate rather large, with 2 or 3 semicircles of small shields or scales.

Scales on upper surface of tibia as large as or a little smaller than dorsals, distinctly keeled. 26 to 31 lamellar scales under the fourth toe. 20 to 26 femoral pores on each side.

Caudal scales truncate or very obtusely pointed behind, the upper narrow and slightly oblique, or rather broad and more oblique, more or less strongly keeled, the whorls equal or subequal in length; 28 to 38 scales in the fourth or fifth whorl behind the small postanal granules.

* In 7 specimens out of 19.

† Two superposed postnasals in two female specimens (Morea and Kalamata).

‡ 4 on both sides in 9 specimens, 4 on one side and 5 on the other in 9, 5 on both sides in 2, one of which is the type of the species.

§ Up to 14 according to Werner, l.c.

The coloration varies much according to individuals. Females and young are beautifully striped with dark brown or black, some specimens may well be described as black above with 5 or 6 light longitudinal streaks or even 7 in front (5 on the nape as in *Acanthodactylus vulgaris*). The adult female may be of a reddish brown, with two broad blackish bands along each side, the outer proceeding from the eye, these bands bordered above and below by a narrow white streak and separated from each other by a third light streak (proceeding from the superciliary edge), which is pale yellow or pale green; one or two small round blue spots above the axil; hind limbs with round light spots edged with blackish; lower parts white or pale yellow, often tinged with rosy or lilac on the sides. Traces of the striation may persist in some adult males, or may disappear entirely, the back being uniform brownish or dull green, with small blackish spots or vermicular lines on the sides. In the breeding male the top of the head is a reddish brown, sharply contrasting with the green of the nape, which gradually fades to olive or brown on the posterior part of the body; the sides of the head and body and the lower parts of a bright vermilion-orange, relieved by a patch of azure-blue in the axillary region and a broad band of the same colour occupying the outer row of ventral shields and extending a little way up the scaly part of the side. Some males may have a pattern of markings not unlike that of *L. taurica*, but with a blackish vertebral stripe on the anterior part of the back; this stripe may be divided by a light streak on the nape.

Measurements (in millimetres):

	♂.	♂.	♀.	♀.
From end of snout to vent	80	70	77	65
„ „ „ fore limb	32	27	28	25
Head	21	19	16	16
Width of head	13	12	10	9
Depth of head	11	10	9	8
Fore limb	27	25	24	22
Hind limb	47	43	41	34
Foot	25	23	21	18
Tail	170	140	105	125

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♀ Morea (type), **P.M.**	48	58	31	10	27	20	27
♂ „	76	57	28	12	28	20–21	30
♀ „	77	59	31	11	30	22	29
♂ Olympia	76	55	28	11	30	23	28

	1.	2.	3.	4.	5.	6.	7.
♂ Olympia	75	64	28	10	30	23	28
,, ,,	64	59	29	12	33	24	28
♀ ,,	71	53	32	11	31	23	27
♂ Mykena	75	64	28	10	30	23	28
,, Tyrins	69	65	29	9	34	26	27
,, Kalamata	75	60	29	10	30	21	26
,, ,,	63	57	28	10	28	21	27
♀ ,,	63	59	31	11	30	21	26
♂ L. Stymphalos	71	63	28	10	30	22–24	28
♀ ,,	65	62	31	11	33	24–25	27
,, Nauplia, **P.M.**	65	58	31	12	28	22	30
♂ Greece	80	56	30	10	31	24–25	29
♀ ,,	70	60	33	11	31	20	30

Columns as in the preceding table.

Habitat.—This species inhabits Morea; its reported occurrence in Crete requires confirmation.

Lacerta peloponnesiaca is most nearly related to *L. taurica*, from which it differs chiefly in the larger head in the male, the non-serrated collar, the truncate or very indistinctly pointed caudal scales, and the nearly constant absence of granules between the supraoculars and the superciliaries. The latter character and the strong palatal dentition separate it from *L. muralis*.

In some respects (stronger palatal dentition, absence of granules between the supraoculars and the superciliaries, more pronounced striation) this species is phylogenetically less advanced than *L. taurica*, but in all others it has evolved further from the hypothetical ancestral form. For reasons explained above (p. 34) I regard the coloration of the young as the most primitive in the *L. muralis* group, as in some specimens the original five light dorsal streaks are preserved on the nape; but on the sides the light streaks are reduced to one, the median lateral of *L. agilis*.

18. LACERTA MURALIS.

FORMA TYPICA.

Seps muralis, Laur. Syn. Rept. pp. 61, 162, pl. i, fig. 4 (1768); Koch, in Sturm, Deutschl. Faun. iii, pt. 6 (1828).

Lacerta muralis, Latr. Hist. Rept. i, p. 229 (1802); M.-Edw. Ann. Sc. Nat. xvi, 1829, pp. 67, 84; Dugès, t.c. p. 380; Dum. & Bibr. Erp. Gén. v, p. 233 (1839); Guérin, Icon. R. An., Rept. pl. v, fig. 1 (1844); Fatio, Vert. Suisse, iii, p. 92 (1872); Leydig, Deutschl. Saur. p. 225.

(1872); Schreib. Herp. Eur. p. 408 (1875); Lataste, Herp. Gir. p. 71 (1876); Klunz. Württ. Nat. Jahresh. xxxix, 1883, p. 108; Camerano, Mon. Saur. Ital. p. 30 (1885); Bouleng. Cat. Liz. iii, p. 29 (1887); R. Blanch. Mém. Soc. Zool. France, iv, 1891, p. 502; Méhely, Beitr. Mon. Kronstadt, Herp. p. 19 (1892); Douglass, Herp. Baden, p. 20 (1894); Martin & Rollin. Vert. Dép. Indre, p. 284 (1894); Méhely, Zool. Gart. xxxvii, 1896, p. 109; Werner, Rept. Amph. Oesterr.-Ung. p. 38 (1897); Dürigen, Deutschl. Amph. Rept. p. 188, pl. xi, figs. 4, 5 (1897); Bouleng. Tr. Zool. Soc. xvii, 1905, pp. 352, 376, pl. xxiv, figs. 1–5; Fejervary, Beitr. Herp. Rhônetal, p. 40, figs. (1909); Mourgue, Feuille Jeunes Nat. 1910, pl. ix; Schreib. Herp. Eur., ed. 2, p. 410 (1912); Bouleng. Tr. Zool. Soc. xx, 1913, pp. 137, 142, 147, 161, pl. xvi, figs. 1–9.

Lacerta maculata, Daud. Hist. Rept. iii, p. 208, pl. xxxvii, fig. 1 (1802); Risso, Hist. Nat. Eur. Mér. iii, p. 86 (1826).

Lacerta agilis, Daud. t.c. p. 211, pl. xxxviii, fig. 1; Risso, l.c.

Lacerta brongniartii, Daud. t.c. p. 221.

Lacerta agilis grisea, part., Hermann, Obs. Zool. p. 258 (1804).

Lacerta lateralis, Merr. Tent. Syst. Amph. p. 67 (1820).

Lacerta merremia, Risso, t.c. p. 86.

Lacerta fasciata, Risso, t.c. p. 87.

Podarcis muralis, Wagl. Syst. Amph. p. 155 (1830); Bonap. Icon. Faun. Ital., Amf. (1836); Tschudi, N. Denkschr. Allg. Schweiz. Ges. i, 1837, No. 4, p. 94; Massalongo, Erp. Pop. p. 25 (1854); De Betta, Mem. Acc. Verona, xxxv, 1857, p. 147, and Fauna d'Ital., Rett. Anf. p. 28 (1874); Camerano, Atti Acc. Torin. xiii, 1877, p. 94; De Betta, Atti Ist. Ven. (5) iv, 1878, p. 889, and v, 1879, p. 307.

Podarcis muralis rubriventris, Bonap. op. cit.

Zootoca muralis, Gray, Cat. Liz. p. 28 (1845).

Podarcis muralis, var. *cupreiventris*, Massalongo, l.c.

? Lacerta porphyrea, Dehne, Allgem. Deutsch. Naturh. Zeit. (2) ii, 1856, p. 213.

Podarcis muralis, vars. *nigriventris*, *albiventris*, *flaviventris*, De Betta, Mem. Acc. Verona, xxxv, 1857, p. 154.

Lacerta muralis, var. *rasquinetii*, Bedriaga, Arch. f. Nat. 1878, p. 260, pl. x, figs. 1, 2; Bouleng. Tr. Zool. Soc. xvii, 1905, p. 360; Schreib. op. cit., ed. 2, p. 410.

Lacerta muralis fusca, part., Bedriaga, t.c. p. 267, and 1879, p. 288, Bull. Soc. Zool. France, 1879, p. 212, and Abh. Senck. Ges. xiv, 1886, p. 187; Werner, Rept. Amph. Oesterr.-Ung. p. 40.

Lacerta muralis punctato-fasciata, Eimer, Arch. f. Nat. 1881, p. 344, pl. xiii, figs. 6–9.

Lacerta muralis, var. *maculiventris*, Werner, Verh. Zool.-bot. Ges. Wien, xli, 1891, p. 752; Schreib. op. cit. p. 410.

Lacerta muralis, vars. *oyensis* et *calbia*, R. Blanch. Mém. Soc. Zool. France, iv, 1891, pp. 505, 507, pl. iv.

Lacerta muralis, var. *hesperica*, Schreib. op. cit. p. 943.

? Lacerta muralis atrata, Boscá, Bol. Soc. Espan. H. N. xvi, 1916, p. 329.

Lacerta muralis riveti, Chaban. Bull. Mus. Paris, 1919, p. 23.

Head a little less than $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, more or less depressed, its depth equal to the distance between the anterior corner, the centre, or the posterior corner of the eye and the tympanum, its length $3\frac{2}{3}$ to 4 times in length to vent in males, 4 to 5 times in females; snout more or less obtusely pointed, as long as or slightly shorter than postocular part of head; cheeks not swollen. Pileus flat or feebly convex, $1\frac{4}{5}$ to $2\frac{1}{5}$ times as long as broad. Neck as broad as the head, or slightly constricted. Body rather strongly depressed. Hind limb reaching the axil, the shoulder, or the collar in males, the wrist or not quite so far, the elbow of the adpressed fore limb, or the axil in females; foot up to $1\frac{1}{3}$ times the length of the head, rarely (in males) not longer than the head or even slightly shorter*; digits rather slender, more or less compressed. Tail cylindrical or cyclo-tetragonal, often slightly flattened at the root, sometimes of equal thickness in its anterior third or half, usually tapering from the base, its length $1\frac{3}{5}$ to $2\frac{1}{4}$ times that of head and body,† shorter in the very young.

Pterygoids toothless.

Nostril pierced between three shields (rarely four). Nasals usually forming a median suture, variable in extent, but usually short; rostral sometimes‡ in contact with the frontonasal, which is usually broader than long and broader than the internarial space, rarely in contact with the frontal§; an azygos shield sometimes separates the pre-

* Male from Bosnia. The specimens from Bosnia, Herzegovina, and Bulgaria have comparatively short hind limbs, not reaching beyond the axil in males—the minimum in specimens from Central Europe.

† Schreiber, op. cit., ed. 2, p. 943, mentions a male from Saragossa in which the tail is nearly $\frac{3}{4}$ of the total length.

‡ Several specimens from Eaux-bonnes, St. Epain, St. Malo, and Dinant, Belgium. Single specimens from Paris, Tours, Fontainebleau, St. Lunaire, Dinan, Glenan Isles, Bordeaux, Hernani, Silos, and Bazias. (22 cases altogether.) Also in at least 20 per cent. of the specimens from south of the Alps.

§ Specimens from Glenan Isles, Bordeaux, Eaux-bonnes, Florence, Autrodera, Bozen, Herkulesbad.

frontals; frontal usually as long as its distance from the end of the snout, often a little shorter, sometimes a little longer,* usually broader in front than behind, where its width usually equals or is a little less than that of the supraoculars; parietals $1\frac{1}{5}$ to $1\frac{2}{3}$ times as long as broad,† usually in contact with the upper postocular,‡ the outer border never distinctly concave in front for the reception of the anterior upper temporal; occipital usually shorter than and as broad as or narrower than the interparietal, but sometimes as long and not rarely broader,§ very exceptionally minute or reduced to a granule; a small shield sometimes separates the interparietal from the occipital. Four supraoculars, first small or very small,‖ second as long as or longer than third, fourth small, sometimes divided into two; 4 to 6 superciliaries, first usually longest and forming an oblique suture with the second; a series of granules, rarely reduced to as few as five, between the supraoculars and the superciliaries; the first or the first and second superciliaries usually in contact with the second supraocular, but the series of granules sometimes complete, extending from the first supraocular to the upper postocular. Rostral very rarely entering the nostril¶; nasal usually separated from the anterior loreal by the postnasal,** which is single††; anterior loreal much shorter than second; four upper labials anterior to the subocular, rarely three or five; subocular very variable in shape, its lower border usually narrower than the upper, but sometimes quite as long. Temporal scales small, polygonal,

* Shortest frontal, measuring only $\frac{3}{5}$ its distance from end of snout, in a male from St. Malo. Fejervary (op. cit.) figures the head-shields of a specimen from Bex, Switzerland, in which the frontal is in contact with the first supraocular.

† In four specimens from Lower Austria the parietal on both sides is completely divided into two by a horizontal suture, in six the division is complete on one side and incomplete on the other, whilst all the others from the same district show at least an indication of this aberrant condition, such as is rarely met with in other parts of Europe. A female from Jersey has each parietal completely divided into two.

‡ Exceptions, in which the anterior upper temporal is in contact with the fourth supraocular, in 12 per cent. of the specimens examined by me (France, Austria, Spain).

§ Posterior border as broad as that of the frontal in a male from S. of the Abruzzi, in a female from Jersey, in 2 males and 1 female from Villefranche s. M., and in a male from Hernani.

‖ Absent in a male from Reichenau and in a female from Vöslau.

¶ Male from Fontainebleau and male from Bies Glacier, near Randa; also in the two specimens from Crete, which I have long hesitated to refer to this form.

** Exceptions not at all infrequent.

†† Absent, fused with the anterior loreal, in a male from St. Malo; divided into two in a female from Paris.

often granular; upper temporals, 1, 2, or 3, or more numerous and not much enlarged; masseteric and tympanic nearly always present,* the former usually large, round or oval.

19 to 32 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate, usually 21 to 27; gular fold usually distinct, indicated by one, two, or three series of minute granules. Collar without, or with merely a trace of, serration, composed of 7 to 13 plates, usually 8 to 11.

Scales on body granular, juxtaposed, round or oval-hexagonal, more or less distinctly keeled, rarely smooth,† often a little larger on the back than on the sides; 42 to 62 scales across the middle of the body‡; 3 or 4, rarely 2 or 3 or 4 or 5, transverse series correspond to one ventral plate, 29 to 45 to the length of the head. Ventral plates in 6 longitudinal§ and 23 to 32 transverse series, 23 to 28 in males, 25 to 32 in females; the plates of the two median series as broad as or narrower, usually much narrower, than those next to them, the outer abruptly differentiated from the lateral scales. Preanal plate very variable in size and shape, but usually large, bordered by one semicircle of small plates, often with an outer semicircle of smaller plates or scales, the median pair of the inner semicircle sometimes enlarged, very rarely fused to one large plate.‖

Scales on upper surface of tibia granular, more or less distinctly keeled, usually smaller than those on the back, rarely nearly as large. 13 to 27 femoral pores on each side.¶ 20 to 29 lamellar scales under the fourth toe, usually 21 to 26.**

Caudal scales usually narrow, truncate or very obtusely pointed,

* Totally absent in 7 out of 100 specimens from Burgos, Spain, also in a male from Hernani and in a few specimens from the Pyrenees. In a male from Barcelona there are neither enlarged upper temporals nor masseteric shield, in this respect agreeing with *L. dugesii*, which, however, has constantly two postnasals and five anterior upper labials.

† In two specimens from Dinant, Belgium, in one from Bagnères de Bigorre, and in most from Burgos and Barcelona.

‡ 42–53 in Lower Austria, 45–57 in the Balkan Peninsula, 46–62 in Spain, 47–62 in France and Belgium, 49–60 in Italy.

§ In a female from Jersey some of the outer ventrals are divided into two, thus forming 8 incomplete series.

‖ Female from St. Lunaire.

¶ 13–19 in Lower Austria, 13–22 in the Balkan Peninsula, 13–21 in Spain, 15–25 in Italy, 16–27 in France and Belgium. In a male from Pietrocamala-Casale, Abruzzi, there is a second series of smaller pores, as is frequently found in the var. *sardoa*—6 on the right side, 4 on the left.

** As for the gular scales, and, curiously, in both cases 23 is the most frequent number.

straight or oblique, the upper more or less strongly keeled, rarely nearly smooth,* the lower smooth or feebly keeled; the whorls alternately longer and shorter, the feature more distinct in some specimens than in others; 25 to 32, exceptionally 20 or 40,† in the fourth or fifth whorl behind the postanal granules; apical sensory pits often more or less distinct.

Upper surface varying from grey to brown, sometimes with a tinge of greenish. Two light, whitish, yellow, or greenish streaks or series of spots on each side, the upper from the outer edge of the parietal to the upper surface of the base of the tail, the lower from the upper lip, through the middle or the lower part of the tympanum, to the base of the thigh, reappearing on the tail; between these two streaks, which may be edged with black, a dark brown band, often spotted with whitish, yellow, bluish, or greenish, among which but rarely a larger ocellar spot, sometimes with green or blue centre‡ above the shoulder; frequently a dark brown or black vertebral stripe or series of spots§; the back often speckled, spotted, or marbled with dark brown or black, the markings sometimes wavy transverse bands on the posterior part of the body. Some specimens, especially males, entirely marbled or reticulate with black, without or with mere traces of the light lateral streaks. The markings sometimes reddish brown or even brick-red. Upper surface of head uniform or speckled, spotted, or marbled with brown or black. Limbs usually with white, black-edged spots. Black and white spots on the side of the tail, usually forming regular bars, which may be connected above by V-shaped dark markings; in some specimens the dark lateral band is continued on the tail, and it usually reappears on the regenerated part.

Lower parts white, pink, yellow, orange or brick-red, the orange or red more frequent in males than in females,‖ immaculate or with black

* Female from St. Lunaire; very feebly keeled in a male from Salonica.

† 20 in a female from Vöslau, 40 in a male from Bassovica

‡ As in a large female, with strongly depressed head, from Bagnères de Bigorre, figured in Tr. Z. S. xvii, pl. xxv, fig. 7. Also in specimens from Paris, the Pyrenees, the Alps near Randa, and Piedmont.

§ A female from Vöslau is remarkable in having a paired series of dark spots along the spine, as in the Spanish and Caucasian varieties.

‖ The colour of the lower parts is of no importance for the definition of varieties, as I have seen specimens from the same locality with the belly white, pink, or red, and it is not always a guide for the distinction of the sexes, as the so-called var. *rubriventris* may be found in both sexes (Bedriaga, Bull. Soc. Zool. France, 1879, p. 215). Kammerer is mistaken when he says of the female (Arch. Entwickm. xxix, 1910, p. 459), "Ventralseite des normalen *L. muralis* niemals rot."

spots, the black spots small or reduced to dots in females, often numerous and large in males, in which they may be confluent into longitudinal bands on the sides of the belly; some males with the throat and belly cream-colour with rust-red spots; sky-blue spots usually present on the outer row of ventral plates, especially in males.* Sometimes a dark streak along the series of chin-shields, forming a chevron-shaped marking as in *L. atlantica* and *L. galloti*.

The following notes are taken from exceptional specimens:

Male from St. Lunaire. Black above, with numerous round lemon-yellow spots; belly pinkish white, spotted with black.

Males from La Deva, opposite Arnao (var. *rasquinetii*, Bedr.). Dark olive-green to dark brown above; a series of black spots along the middle of the back; sides of body sky-blue with a black network; large black spots on the upper surface of the tail; lower parts bright red, much spotted with black; the whole of the outer row of ventral plates and the outer half of the adjacent plates sky-blue.

Males from Bassovica, near Trieste (var. *maculiventris*, Werner). Much spotted with black above and beneath, with a black, wavy lateral band; approaching the var. *brueggemanni*.

In some males from Bosnia the belly is spotted to such an extent as to appear black with numerous small white spots.

Uniform black specimens have been reported from Bordeaux† and the Italian lakes‡ and I have seen two from Florence,§ and one from Marseilles (in the Paris Museum).

L. Vaillant‖ in announcing the very interesting find of two specimens of bluish-black wall-lizards on one of the Glenan Isles, on the Atlantic coast of Brittany, has recorded them under the name of var. *lilfordi*. I have had the opportunity of examining one of them in the Paris Museum, and, as I expected, it agrees entirely in its lepidosis with the typical form.¶

Young, just out of the egg, are dark grey above with round or vermicular lighter spots; a black vertebral line is often present; the two lateral streaks are usually very distinct and formed of more or less

* Chabanaud (1919) has pointed out their absence in several specimens from Macedonia.

† Lataste, Herp. Gir. p. 76.

‡ Kammerer, Zentralbl. f. Physiol. xx, 1906, p. 261.

§ On one of which I have reported in P. Z. S. 1905, ii, p. 324.

‖ Bull. Mus. Paris, 1906, p. 438.

¶ I am not sure whether or not to refer to the typical form the *L. muralis atrata*, Boscá, from Las Ferreres Islets, Castellon: black above and dark blue beneath. Black lizards, mixed with the "lagartejas ordinarias," were also found on the mainland in the same province.

confluent white spots; the blackish band between them, continued from the temple, bears small round white spots; limbs blackish spotted with white; lower parts white.

Measurements (in millimetres):

	♂										♀							
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
From end of snout to vent	72	62	59	57	70	64	63	64	66	65	67	60	70	56	59	57	60	55
,, ,, ,, fore limb	28	25	21	24	28	25	25	25	25	27	22	21	24	19	21	21	22	19
Length of head	18	16	15	15	18	16	17	17	17	17	14	14	15	12	13	13	14	12
Width of head	12	11	9	9	12	11	11	11	11	10	9	9	10	8	9	9	9	8
Depth of head	9	8	7·5	7	10	8	8	7·5	8	8	7	7	8	6	7	6	6	6
Fore limb	23	23	21	20	24	22	23	23	21	24	20	19	20	18	18	19	21	18
Hind limb	35	35	31	30	36	35	36	38	32	38	30	30	27	25	26	29	32	26
Foot	20	19	17	17	19	18	19	21	16	19	17	16	15	14	14	16	17	15
Tail	—	125	—	110	—	123	140	—	135	—	118	97	—	93	—	115	115	—

1, 11. Glenan Isles. 2, 12. Eaux-bonnes. 3, 14. Vöslau. 4, 15. Herkulesbad. 5. La Deva (type of var. *vasquineti*). 6, 16 Turin. 7, 17. Genoa. 8. Bassovica (type of var. *maculiventris*). 9, 18. Bosnia. 10. L. Stymphalos. 13. Pic du Midi.

The above measurements, compared with those of specimens of varieties referred to in Group A, dispose of the statement of Eimer that the typical form, his platycephalous type, can be distinguished from the pyramidocephalous type (vars. *campestris* and *albiventris*) by a broader head in proportion to its depth, in adult males. In the above table the depth of the head as compared to the width varies from $\frac{3}{3}$ to $\frac{5}{6}$; in the males of Group A from $\frac{3}{4}$ to $\frac{9}{10}$.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
France and Channel Islands:							
♀ Jersey	47	59	32	9	27	17–18	23
♂ Great Chausey Id.	63	55	28	9	26	20–21	26
,, ,,	63	52	27	9	25	20	26
♀ ,,	67	51	29	9	20	19	23
♂ St. Malo	66	47	26	11	21	18	22
♀ ,,	66	54	30	9	26	20	24
,, ,,	62	50	32	9	26	19	22
,, ,,	53	50	29	9	25	20–22	22
♂ St. Lunaire, nr. St. Malo	72	60	27	10	27	22–23	23
,, ,, ,,	58	53	25	11	22	20–22	22
,, ,, ,,	58	55	25	12	24	23	23
♀ ,, ,,	67	53	30	9	24	21–22	23
,, ,, ,,	63	56	28	7	25	21	23
,, ,, ,,	55	54	29	12	22	19–20	23
♂ Dinan	55	61	26	9	26	24–25	26
,, ,,	55	52	25	9	25	22	25

	1.	2.	3.	4.	5.	6.	7.
♀ Dinan	75	52	29	9	22	19	25
,, ,, ...	70	54	30	10	23	23-22	23
♂ Glenan Isles . . .	63	55	28	9	26	18–19	25
♀ ,, . . .	67	51	29	9	20	18	23
♂ ,, **P.M.** . .	69	59	24	9	27	21-22	24
,, Bouron, Fontainebleau .	65	56	24	10	25	21–23	24
,, ,, ,, . .	65	53	25	10	26	19	23
♀ ,, ,, . .	63	54	26	9	27	19	23
♂ Tours	55	57	25	9	21	18–19	24
,, ,, ...	50	50	24	9	26	19	25
,, St. Epain, Indre-et-Loire .	62	55	25	8	27	21–20	23
,, ,, ,, .	58	57	23	10	23	19	24
,, ,, ,, .	56	53	23	13	23	18–19	23
,, ,, ,, .	59	51	27	9	21	17–16	21
,, ,, ,, .	57	53	28	9	22	19	22
♂ Oléron	61	54	25	9	24	20–19	26
,, ,, ...	56	50	23	9	21	18–17	25
♀ ,, ...	59	53	28	11	20	17–19	23
,, Cap Ferret, Arcachon . .	64	53	27	9	25	18–19	24
,, ,, ,, . .	52	59	28	10	25	22	23
♂ Achard, near Bordeaux .	60	52	25	11	20	19	24
♀ Bagnères de Bigorre, Pyrenees, **B.M.** . . .	72	55	29	10	21	17	26
♂ Eaux-bonnes, Pyrenees, 700–1100 m.	66	53	25	11	25	17–19	23
,, ,, ...	64	54	27	11	27	17	24
,, ,, ...	64	54	25	11	26	16-17	23
,, ,, ...	54	55	25	9	26	21–20	23
,, ,, ...	65	48	29	11	21	16–18	22
,, ,, ...	65	58	28	10	23	17	23
,, ,, ...	59	51	29	9	23	18–19	24
,, ,, ...	53	50	27	9	25	16	24
,, Aspin, nr. Pic du Midi, 1545 m.	70	50	28	9	19	17–16	24
♂ Odilienberg, nr. Strasburg .	64	48	26	8	20	18–20	25
♀ ,, ,, .	58	55	27	11	22	19	24
♂ Grande Chartreuse, Isère, **L.M.**	64	58	24	11	23	17–18	21
,, Montpellier	59	55	26	9	29	21–20	24
♀ ,, ...	64	54	32	9	29	23-22	27
,, Marseilles, **P.M.** . . .	54	55	26	10	23	20–21	24
♂ Riou Islet, nr. Marseilles .	62	56	26	10	24	19	26

	1.	2.	3.	4.	5.	6.	7.
♂ Riou Islet, nr. Marseilles .	60	52	25	8	23	18–19	25
„ Villefranche s. M. . .	51	52	23	11	24	18–20	22
„ „ „ . .	50	50	23	9	20	17–18	22
♀ „ „ . .	44	57	27	8	23	20–21	23
♂ Valdeblore, Alpes-Marit., 1000–2000 m. . . .	67	61	25	9	31	27–25	24
„ „	66	58	24	11	32	23–21	26
„ „	61	59	27	11	25	21–19	26
„ „	55	62	25	11	25	21–22	25
„ „	51	53	25	10	23	19	24
„ „	49	51	25	9	22	19–20	26
♀ „	60	47	29	8	24	20	23
„ „	57	59	25	10	25	20	24
BELGIUM:							
♂ Dinant	60	54	25	9	21	18–20	26
„ „	57	58	25	10	23	21–20	23
„ „	54	55	25	9	23	21–20	25
„ „	50	55	25	9	25	20	24
♀ „	59	54	27	7	25	20–21	24
„ „	56	62	28	9	24	21–18	26
„ „	55	53	29	9	24	19–20	25
„ „	55	59	27	9	24	21–20	23
♂ Maredsous, nr. Dinant .	65	55	24	9	23	20–21	26
„ Denée „ . .	61	54	25	11	27	19	26
„ „ „ . .	60	57	23	11	22	20–19	24
„ „ „ . .	57	59	24	10	26	21–19	25
„ „ „ . .	57	56	25	11	24	19–21	26
„ „ „ . .	52	55	25	10	24	18–19	25
„ „ „ . .	50	57	24	9	26	18–19	25
♀ „ „ . .	62	55	27	10	25	18–19	24
„ „ „ . .	55	54	27	10	27	20–22	27
„ „ „ . .	53	55	27	10	23	18	25
„ „ „ . .	53	54	27	9	25	20–19	23
„ „ „ . .	52	58	26	9	24	19–18	23
„ „ „ . .	50	55	28	9	26	19–20	25
GERMANY:							
♀ Lower Ahr	62	55	27	9	27	21–20	23
♂ Heidelberg	55	57	24	10	22	18	24
♀ „	53	50	25	9	23	23–21	24
♂ „ **P.M.** . . .	61	58	25	11	21	19–21	27
♀ „ „ . . .	58	55	27	9	20	18–17	22

	1.	2.	3.	4.	5.	6.	7.
SWITZERLAND:							
♂ Binningen, nr. Basle . .	62	55	24	9	20	18–19	23
„ „ „ . .	62	58	27	11	22	19–18	24
♀ „ „ . .	65	58	28	9	23	19	25
„ „ „ . .	65	55	28	10	25	20	25
♂ Randa, nr. Zermatt, 1700 m.	57	51	26	9	24	20–19	24
„ „ „ „	56	52	26	9	27	20	26
AUSTRIA:							
♂ Baden, nr. Vienna . .	60	53	24	9	22	15	23
„ „ „ **W.C.** .	59	52	24	9	24	17	23
„ „ „ . . .	56	50	24	10	21	15–16	25
♀ „ „ . . .	55	46	26	8	19	16	23
♂ Vöslau, „ . . .	59	50	24	9	23	19–18	24
„ „ „ **W.C.** .	58	46	24	9	22	16	24
„ „ „ . . .	38	50	24	9	23	18–16	22
♀ „ „ . . .	57	48	27	9	26	16	25
„ „ „ . . .	56	42	28	9	22	13	22
♂ Mödling, nr. Vienna, **W.C.** .	45	47	25	8	23	19–16	24
„ Reichenau „ „ .	45	47	25	10	21	16	22
„ Pernitz „ „ .	53	49	24	10	24	18	24
„ Meisenbach „ . .	60	50	24	10	22	18–16	23
„ „ „ **W.C.** .	59	52	23	8	26	18	24
CARNIOLA:							
♂ St. Peter	50	55	26	9	23	17	24
„ „	50	50	25	9	22	15–16	23
HUNGARY AND TRANSYLVANIA:							
♂ Bazias	59	52	26	11	27	20	23
„ Herkulesbad . . .	57	59	25	10	30	19–20	25
♀ „ . . .	59	55	25	9	27	18–20	22
SPAIN:							
♂ Barcelona	57	62	25	9	27	19	25
„ „	57	56	27	11	30	20–21	23
„ „	50	61	24	10	30	20	26
„ „	45	61	26	10	30	20	26
♀ „	45	60	30	9	27	19–18	21
♂ Hernani, Guipuzcoa . .	53	53	23	10	20	18–16	23
„ „ „ . .	50	58	26	9	25	19–18	24
♀ „ „ . .	62	48	27	12	22	17–16	23
„ „ „ . .	59	53	26	9	21	16–17	21
„ „ „ . .	56	54	27	10	25	17–16	26

	1.	2.	3.	4	5.	6.	7.
♂ La Deva, Arnao (type of var. *rasquineti*) . . .	70	58	26	9	25	17–18	25
„ Burbia, Leon . . .	50	57	26	12	24	18–19	22
„ Corunna	50	52	26	11	23	18	22
♀ „	53	57	26	10	22	17–18	26
♂ Silos, Burgos . . .	60	52	27	9	27	17	26
„ „ „ . . .	59	52	26	9	26	17–18	23
„ „ „ . . .	55	48	26	11	24	19	22
„ „ „ . . .	53	54	25	11	28	16	25
„ „ „ . . .	51	52	25	9	22	15–14	24
„ „ „ . . .	50	49	24	11	23	15	23
♀ „ „ . . .	51	50	29	9	22	14–13	22
„ „ „ . . .	48	50	29	9	23	16–18	20
„ „ „ . . .	47	46	28	9	25	16–17	23
„ „ „ . . .	45	48	30	9	22	14–13	23
„ „ „ . . .	42	50	30	9	23	15	21
„ „ „ . . .	40	49	30	10	24	15	22
♂ Castrillo de la Reina, Burgos	64	51	27	9	27	20–19	?
„ „ „ „	61	50	26	11	23	17–16	25
„ „ „ „	57	46	26	10	24	17–16	21
„ „ „ „	53	50	27	9	22	16–15	26
♀ „ „ „	53	50	31	10	25	14–15	21
„ „ „ „	51	50	28	11	21	16	22
♂ Saragossa	63	56	26	11	25	19–20	24
„ „	51	55	26	11	27	19	26
♀ „	59	53	30	8	25	18–16	26
„ „	50	56	29	9	28	18	25
♂ Lozoya Valley, nr. Madrid .	69	56	24	10	24	18	24
„ „ „ „ .	63	60	25	9	25	20–19	26
„ „ „ „ .	60	55	23	9	22	16–17	26
„ „ „ „ .	56	56	25	9	24	17–18	27
♀ „ „ „ .	65	60	28	9	26	18–17	25
„ „ „ „ .	62	58	28	10	23	17	25
„ „ „ „ .	60	48	27	9	24	18–17	23
„ „ „ „ .	58	56	27	9	23	15	23
ITALY :							
♂ Bozen, S. Tyrol . . .	63	56	25	8	28	19–20	25
„ „ „ . . .	63	55	26	9	23	21	24
„ „ „ . . .	62	56	26	12	26	21	24
♀ „ „ . . .	67	57	30	10	28	21	28

	1.	2.	3.	4.	5.	6.	7.
ITALY:							
♂ Bassovica, nr. Trieste (type of var. *maculiventris*), **W.C.**	64	56	25	9	29	20–19	29
„ Domodossola, Piedmont	65	51	25	10	23	20–19	25
♀ „ „	58	60	27	8	27	23–21	25
„ „ „	52	53	26	7	22	16–18	25
♂ Turin	64	56	25	10	26	23	26
„ „	64	58	25	9	28	21–22	21
„ „	62	58	25	11	25	24–21	23
„ „	60	56	24	10	23	18	21
„ „	57	58	28	8	28	19	26
„ „	57	55	29	8	22	23–21	25
♂ Lanzo Valley, Piedmont	61	54	26	8	27	20	27
„ Genoa	63	60	24	10	28	22	26
„ „	58	55	26	9	26	19	24
„ „	60	58	27	10	27	19	23
„ Portofino, nr. Rapallo	60	56	27	8	26	20	27
♂ Ferreira, Apennines	60	54	24	11	24	22–21	26
♀ „ „	57	54	25	11	24	24–25	24
♂ Florence	63	60	24	9	26	21–20	25
„ „	59	52	26	8	22	20–17	21
„ Autrodoco, Abruzzi	59	54	25	8	23	18–17	26
„ Pietrocamala-Casale, Abruzzi	63	49	26	8	24	19	24
„ Villalaga-Auversa „	50	49	24	10	21	17	23
„ Montreale, Abruzzi	58	49	24	9	19	20–21	24
„ „ „	56	54	23	9	24	21–18	24
♀ „ „	56	51	28	8	23	19	25
„ „ „	56	50	28	9	21	17–19	22
♂ Monte Gargano	57	53	24	10	25	16–15	26
„ „ „	57	55	24	10	23	18–17	26
„ Calabria ulta, **F.M.**	60	54	25	9	24	17–16	25
♀ „ „ „	55	55	27	10	23	18	25
BOSNIA AND HERZEGOVINA:							
♂ Bosnia	66	55	23	10	23	17–18	24
„ „	65	52	24	8	25	21–19	26
♀ „	55	46	28	9	22	15–16	24
♂ Travnik	52	54	22	9	22	18–17	22
„ Livno, **W.C.**	49	49	24	9	21	15–16	23
♀ „ „	55	45	29	9	22	16–17	23
♂ Herzegovina „	63	50	24	10	23	17–16	23
„ Korito „	64	50	26	9	24	18–19	24
♀ „ „	63	46	30	8	24	15–16	23

	1.	2.	3.	4.	5.	6.	7.
BULGARIA:							
♂ C. Bulgaria, **W.C.**	60	52	24	9	26	19–20	26
„ Teteven	61	54	24	9	25	19–20	25
„ „	58	55	25	8	28	21–22	25
„ Panagiurista	55	52	23	8	26	20	23
„ Rutshuk	55	53	25	9	24	18–19	24
♀ „ **W.C.**	54	52	26	9	29	19–18	23
GREECE:							
♂ Macedonia (type of *L. m. riveti*), **P.M.**	57	53	28	10	24	22–20	27
„ L. Stymphalos	65	54	26	11	24	20–19	28
„ Pentelikon, nr. Athens	63	54	24	9	24	22–24	27
„ Crete	48	60	27	10	31	20	26
♀ „	57	58	28	11	31	20–21	22

1. Length from snout to vent (in millimetres). 2. Scales across middle of body. 3. Transverse series of ventral plates. 4. Collar plates. 5. Gular scales in a longitudinal series. 6. Femoral pores (right and left). 7. Lamellar scales under fourth toe.

Habitat.—Central Europe as far north as Normandy and Jersey, the Meuse, Rhine, and Danube systems; Northern and Central Spain, Italy (only a few localities in the Peninsula), Balkan Peninsula. Reaches the altitude of 2000 metres in the Alps, 1500 metres in the Pyrenees, 1200 metres in Bosnia.

The Varieties of Lacerta muralis.

The polymorphism of this widely distributed species is probably exceeded by no other in the Class Reptilia. Some of the Southern forms which I regard as varieties or subspecies are so different in form, lepidosis, and coloration from the *L. muralis* of Central Europe that it is no wonder they should have been considered as worthy of specific rank by many authors who attempted to define them by characters which do not hold when tested on large series of specimens, as the detailed descriptions here given will show.

All the forms are so intimately linked that I feel bound to adhere to the view I have always held that they should be united under the comprehensive name of *L. muralis*.* Even the definition of them as

* In this respect I have the support of Prof. Giglio-Tos (L'Autosterie, Arch. Entwmech. xxx, 1909, p. 53), according to whose views specific distinction resolves itself essentially into a question of gametic correspondence, the male

varieties is a matter of the greatest difficulty, if a conscientious adherence to facts is never to be departed from. The grouping of the varieties is also very perplexing, and in the following attempt at some sort of arrangement special consideration has been given to the geographical distribution, in view of what I hold to be examples of parallel evolution and convergence. A list of the principal varieties will show the arrangement which I have adopted as the most practical for the expression of their mutual affinities. The five groups radiate from the typical form and in each the variety which I regard as annectant to it is placed first on the list.

Group I	1.	var. *fiumana*, Werner,* p. 179.
	2.	„ *lissana*, Werner, p. 185.
	3.	„ *melisellensis*, Braun, p. 187.
	4.	„ *serpa*, Raf.,* p. 190.
	5.	„ *campestris*, de Betta, p. 193.
	6.	„ *albiventris*, Bp., p. 199.
	7.	„ *hieroglyphica*, Berth., p. 208.
Group II	8.	„ *erhardi*, Bedr., p. 211.
	9.	„ *quadrilineata*, Gray, p. 215.
	10.	„ *filfolensis*, Bedr., p. 219.
	11.	„ *lilfordi*, Gthr.,* p. 225.
	12.	„ *pityusensis*, Boscá, p. 228.
Group III	13.	„ *brueggemanni*, Bedr., p. 232.
	14.	„ *nigriventris*, Bp., p. 237.
	15.	„ *insulanica*, Bedr., p. 241.
	16.	„ *tiliguerta*, Gm., p. 243.
	17.	„ *bedriagæ*, Camer.,* p. 249.
	18.	„ *sardoa*, Peracca,* p. 252.
Group IV	19.	„ *liolepis*, Blgr., p. 256.
	20.	„ *hispanica*, Stdr.,* p. 259.
	21.	„ *vaucheri*, Blgr., p. 261.
	22.	„ *bocagii*, Seoane, p. 262.
	23.	„ *monticola*, Blgr.,* p. 268.

gamete having to fit exactly the female gamete, as for a key to turn in the lock. An examination of the male genital glands is, in his opinion, in most cases sufficient to decide whether a given form should rank as a species or as a variety, and he has, at my request, applied this test to specimens of *L. muralis typica* and var. *nigriventris, albiventris,* and *tiliguerta,* without finding the slightest difference between them, whilst observing another state of things in *L. viridis,* with which he has compared them.

Group V
- 24. var. *breviceps*, Blgr., p. 271.
- 25. „ *horvathi*, Méhely,* p. 273.
- 26. „ *caucasica*, Méhely,* p. 275.
- 27. „ *chalybdea*, Eichw., p. 278.
- 28. „ *saxicola*, Eversm.,* p. 282.
- 29. „ *portschinskii*, Kessl., p. 286.
- 30. „ *defilippii*, Camer., p. 288.
- 31. „ *rudis*, Bedr., p. 290.

The varieties marked * are held to be entitled to specific rank by the most recent writers on the subject, L. von Méhely or E. Schreiber.

I have given photographic figures of a considerable number of specimens belonging to the various varieties, arranged in geographical order, in my papers in the Transactions of the Zoological Society, vols. xvii, 1905, and xx, 1913. However much opinions may differ as to the systematic arrangement of these lizards, I trust these figures will prove of lasting value to those who are not able to refer to the originals, mostly preserved in the British Museum.

On the subject of the rank to be assigned to the various forms here included under *L. muralis*, cf. Méhely, Ann. Mus. Hung. v, 1907, pp. 84, 469, and vii, 1909, p. 247; Bouleng. Ann. & Mag. N. H. (7), xx, 1907, p. 39, and (8), v, 1910, p. 247; Dehaut, Bull. Soc. Zool. France, xxxvi, 1911, p. 8; Bernardi, Mon. Zool. Ital. xxiii, 1912, p. 226.

Group I.—East Coast and Islands of the Adriatic, Italy, Corsica, Sicily, and Coasts of the Sea of Marmora.

This first group may be described as filling up the gap between *L. taurica* and the typical *L. muralis*. It consists mainly of forms which Eimer would have classified as *pyramidocepali striatæ* and *punctato-striatæ*, *reticulatæ* being the exception. Green is the prevailing colour of the upper parts.

The most primitive form, var. *campestris*, passes gradually on the one hand into the var. *fiumana*, which approaches the typical form and of which the vars. *lissana* and *melisellensis* are insular derivatives, on the other hand into the var. *albiventris*. The Sicilian var. *serpa* resembles the var. *fiumana*—no doubt a case of parallel modification from a common ancestor, probably the var. *campestris*, whilst the oriental var. *hieroglyphica* is almost identical with the var. *albiventris*, although so far removed from it geographically.

It is quite impossible to give rigid comparative diagnoses of these forms, so closely do they intergrade, but the following synopsis will suffice in most cases for their correct identification when several

specimens of each are at hand. In all the varieties the scales are more or less distinctly keeled, except in some specimens of the var. *albiventris*.

Var. *fiumana*, Wern. Rostral usually entering the nostril, or narrowly separated from it; 44 to 58 scales across the body (usually 48 to 53); 16 to 24 femoral pores (usually 19 to 22); 22 to 29 lamellar scales under the fourth toe (usually 24 to 27); head $3\frac{3}{4}$ to $4\frac{1}{4}$ times in length to vent in males; hind limb reaching axil or shoulder in males. Size small—50 to 68 millim. from snout to vent. —East Coast and islands of the Adriatic.

Var. *lissana*, Wern. Rostral usually entering the nostril; 51 to 60 scales across the body; 20 to 25 femoral pores; 24 to 31 lamellar scales under the fourth toe; proportions as in the preceding. From snout to vent 52 to 66 millim.—Lissa and Lagosta Ids., Adriatic.

Var. *melisellensis*, Braun. Rostral usually entering the nostril, or narrowly separated from it; 50 to 64 scales across the body; 21 to 27 femoral pores (usually 22 to 24); 25 to 30 lamellar scales under the fourth toe (usually 27 or 28); occipital often much reduced or separated from the interparietal; head $3\frac{1}{2}$ to $4\frac{1}{3}$ times in length to vent in males: hind limb reaching shoulder or collar in males. From snout to vent 50 to 74 millim.—Islets near Lissa.*

Var. *serpa*, Raf. Rostral usually entering the nostril, or narrowly separated from it; 50 to 67 scales across the body (usually 57 to 63); 18 to 23 femoral pores (usually 19 to 22); 27 to 33 lamellar scales under the fourth toe (usually 28 to 30); head $3\frac{2}{3}$ to 4 times in length to vent in males; hind limb reaching collar or between collar and ear in males. From snout to vent 57 to 72 millim.—Sicily.

Var. *campestris*, De Betta. Rostral often entering the nostril, or narrowly separated from it; 50 to 67 scales across the body (usually 53 to 62); 15 to 24 femoral pores (usually 17 to 22); 23 to 30 lamellar scales under the fourth toe (usually 25 to 29); head $3\frac{1}{2}$ to 4 times in length to vent in males; hind limb reaching shoulder, collar, or a little beyond in males. From snout to vent 52–82 millim. —East Coast of the Adriatic, Italy, Corsica.

Var. *albiventris*, Bp. Rostral very rarely touching the nostril; 55 to 78 scales across the body (usually 63 to 75); 19 to 28 femoral pores

* From remarks made by Schreiber in the second edition of his Herpetologia Europæa I conclude that the black lizard of St. Andrea, near Lissa, is not the same as that from Melisello (see var. *albiventris*).

(usually 20 to 25); 25 to 36 lamellar scales under the fourth toe (usually 28 to 33); head $3\frac{1}{2}$ to 4 times in length to vent in males; hind limb reaching shoulder, collar, or between collar and ear in males; ventral plates of the two median rows often as broad, in the middle of the body, as those of the adjacent rows. Size often large, up to 90 millim.—Dalmatia, Islands of the Adriatic, South Italy.

Var. *hieroglyphica*, Berth. Rostral not touching the nostril; 61 to 71 scales across the body; 21 to 26 femoral pores; 30 to 35 lamellar scales under the fourth toe; often 5 upper labials anterior to the subocular; upper caudal scales very diagonal to the keel; head $3\frac{1}{2}$ to 4 times in length to vent in males; hind limb reaching collar or a little beyond in males. From snout to vent 60 to 80 millim.—Coasts of the Sea of Marmora.

I have expressed the opinion * that this group of varieties is derived from primitive forms of which the Eastern species *L. taurica* and *L. peloponnesiaca* are the living representatives, and that a Western branch, represented by *L. campestris* and *L. fiumana*, has terminated in *L. serpa* (*sicula*). It is not impossible that *L. albiventris*, which is so completely connected with *L. campestris*, may have originated in Italy as a cross between the latter and the southern variety of the typical *L. muralis* (var. *brueggemanni*), and, passing across the Adriatic, has again extended to the east (*L. hieroglyphica*). It seems difficult to imagine two forms so similar as *L. albiventris* and *L. hieroglyphica* having originated independently, and to fancy the former derived from the latter would not be in accordance with the principles that have guided me in estimating the value of the morphological characters from the phyletic point of view.

Var. FIUMANA.

Lacerta muralis, var. *neapolitana*, subvar. *a*, part., Bedriaga, Bull. Soc. Zool. France, 1879, p. 202, pl. ix, fig. 5.

Lacerta muralis punctato-striata, Eimer, Arch. f. Nat. 1881, p. 340, pl. xiii, figs. 4 and 5.

Lacerta muralis neapolitana, subvars. *a* et *e*, part., Bedriaga, Abh. Senck. Ges. xiv, 1886, pp. 221, 226.

Lacerta muralis neapolitana, vars. *fiumana*, *olivacea*, part., et *striata*, Werner, Verh. Zool.-bot. Ges. Wien, xli, 1891, p. 753, and Rept. Amph. Oesterr.-Ung. p. 42 (1897).

Lacerta muralis, vars. *campestris* et *olivacea*, Tomasini, Wiss. Mitth. Bosn. Herzeg. ii, 1894, p. 570.

* C.R. Ac. Sci. Paris, clxiv, 1917, p. 803.

Lacerta muralis neapolitana, var. *littoralis*, Werner, Rept. Amph. Oesterr.-Ung. p. 161 (1897), and Wiss. Mitth. Bosn. Herzeg. vi, 1899, p. 819.

Lacerta littoralis, Lehrs, Zool. Anz. 1902, p. 230; Werner, Verh. Zool.-bot. Ges. Wien, lii, 1902, pp. 382 and 384.

Lacerta littoralis, var. *livadiaca*, Werner, Verh. Zool.-bot. Ges. Wien, lii, 1902, p. 383.

Lacerta fiumana, Werner, Bl. f. Aq. u. Terr.-K. xvi, 1905, p. 65, and Wiss. Mitth. Bosn. Herzeg. x, 1907, pp. 660 and 666; Kammerer, Arch. f. Entwicklmech. xxix, 1910, p. 474, pl. xv; Klaptocz, Zool. Jahrb., Syst. xxix, 1910, p. 417; Schreib. Herp. Eur., ed. 2, p. 431 (1912).

Lacerta fiumana, var. *imitans*, Werner, Mitth. Naturw. Ver. Univ. Wien, vi, 1908, p. 49.

Lacerta muralis, var. *fiumana*, Boulenq. Tr. Zool. Soc. xx, 1913, p. 167, pl. xix, figs. 1–7.

I will first give a description of the widely distributed form, from Istria, Croatia, Dalmatia, Bosnia, Herzegovina, Montenegro, Albania and Northern Greece, and various islands on the coast of Istria and Dalmatia, to which the above synonymy pertains, and then refer to the insular forms which are evidently derived from it, and which have been described as vars. *lissana*, *melisellensis*, and *galvagnii*.

The typical var. *fiumana*, which in size and coloration may be regarded as connecting the var. *campestris* with the *forma typica*, is hardly to be distinguished from the former, especially if compared with specimens from Piedmont, where the var. *campestris* does not reach so large a size as elsewhere. It is very easy to distinguish it from the var. *albiventris* as occurring on the East coast of the Adriatic and on several of its islands, but when Italian examples of the var. *campestris* are taken into consideration, the gaps between the two extremes disappear, and a continuous series connecting them is seen to exist. This variety is also very closely related to the var. *serpa* and to *L. taurica*, especially through the variety described by Lehrs as *L. ionica*. Werner* has even hinted to the possible specific identity of his *L. fiumana* with *L. taurica* and *L. ionica*, as had been suggested by Wiegmann,† who alluded to this lizard under the name of *Podarcis merremii*, Fitz. (non Risso), a *nomen nudum* under which *L. fiumana* and other green varieties have often appeared in the past. However, the presence of pterygoid teeth in *L. taurica*‡ is, in my opinion, suffi-

* Bl. f. Aq. u. Terr. K. xvi, 1905, p. 74.

† Arch. f. Naturg. 1837, ii, p. 222.

‡ I have not found these teeth in any specimens of var. *fiumana*, any more than in the typical form.

cient ground for retaining that form as a species, which fills in the gap between the more primitive group of *L. agilis*—*L. viridis* and *L. muralis*, vars. *fiumana* and *campestris*.

The following description differs very little from that of the var. *campestris*, and it is to me often a matter of difficulty to distinguish small specimens of that form from striated specimens of the present. The lower number of scales across the body combined with rather shorter limbs and a smaller size appear to be the most important diagnostic characters, but there is a considerable overlap.

Head small, its length $3\frac{3}{4}$ to $4\frac{1}{4}$ times in length to vent in males, $4\frac{1}{3}$ to $4\frac{3}{4}$ times in females, either flat above, as usual in the typical form, or even more convex than in the var. *campestris*, its depth equal to the distance between the anterior corner or the centre of the eye and the anterior border of the tympanum, its width $1\frac{1}{2}$ to $1\frac{3}{4}$ in its length; snout obtusely pointed, as long as or a little longer than postocular part of head. Body not much depressed. The hind limb reaches the axil or the shoulder in males, the wrist or the elbow of the adpressed fore limb in females; foot a little longer than head (up to once and one fourth). Tail $1\frac{3}{5}$ to $2\frac{1}{5}$ length of head and body.

Rostral shield usually entering the nostril or narrowly separated from it*; nasals forming a suture behind the rostral; a single postnasal†; frontal as long as or a little shorter than its distance from the end of the snout; a series of granules between the superciliaries and the two principal supraoculars, the first of which is usually in contact with the first, or with the first and second, superciliaries; parietals $1\frac{1}{5}$ to $1\frac{1}{2}$ times as long as broad, nearly always in contact with the upper postocular‡; occipital very variable, usually shorter than and as broad as the interparietal, sometimes narrower, sometimes broader§; temporal scales sometimes as small as in a typical *L. muralis*,

* Exceptions in a male from Gorizia and in one from Brestica.

† Two on one side in a male from Scoglio Supetar.

‡ Exceptions in a female from Solta, in one from Gelsa, and in one from Cettinje; Klaptocz (l.c.) also records an exception in a specimen from Albania.

§ $2\frac{1}{2}$ times as broad in a male from Zeč. In a male from Brestica the occipital is as long and twice as broad as the interparietal, whilst in a female accompanying it the former shield is barely half as long and half as broad as the latter. A small shield is sometimes intercalated between the interparietal and the occipital; in a male from Bukovici and in another from Lussin Id. the parietals meet in a short suture between these two shields; the three specimens from the Istrian Karst (E. Schreiber), which formed part of the Lataste Collection, have a short transverse cleft in the parietal on each side of the interparietal.

sometimes nearly as large as in a typical *L. taurica*, variable to the same extent as in var. *campestris*; masseteric shield usually distinct, frequently in contact with the upper temporal, or separated from it by a single series of scales; four* upper labials anterior to the subocular, the lower border of which is much shorter than the upper.

Collar-edge usually feebly but more or less distinctly serrated; 7 to 11 plates in the collar; 20 to 29 scales and granules between the symphysis of the chin-shields and the median collar-plate; gular fold very distinct.

Scales on the back oval-hexagonal or distinctly hexagonal, distinctly or sharply keeled, often smaller on the vertebral line; lateral scales as large as or a little larger than the dorsolaterals, usually more or less distinctly keeled†; 44 to 58 (usually 48 to 53) scales across the middle of the body; 3, or 2 and 3, transverse series of scales correspond to one ventral plate, 31 to 45 to the length of the head. Ventral plates in 6 longitudinal and 25 to 31 transverse series. Preanal plate moderately large or rather small, with two semicircles of small plates; an enlarged median plate sometimes preceding the preanal.

Scales on upper surface of tibia considerably smaller than the dorsals, always distinctly keeled. 16 to 24 femoral pores on each side (usually 19 to 22). 22 to 29 (usually 24 to 27) lamellar scales under the fourth toe.

Upper caudal scales strongly keeled and obtusely but distinctly pointed behind‡: the scales more or less oblique with the keel parallel to the axis of the tail; the whorls more or less distinctly longer and shorter alternately; 28 to 32 scales in the fourth whorl behind the postanal granules.

* Three on one side in single specimens from Trieste, Bosnia, Trebinje, and Zara. Not one of the many specimens examined by me has five, a number which is sometimes found in specimens from Lagosta, and in as many as 10 per cent. of those from Melisello.

† Lehrs (l.c., p. 231) says, "Rücken- und Flankenschuppen *gleich gross*, bis zu den Bauchschildern *deutlich gekielt*." There is no constancy in this character. In a female from Zara, of uniform olive coloration, the scales on the lower part of the flanks are considerably larger than the dorsals, and perfectly smooth. In various striated specimens, including the actual types from Fiume, I also find the lateral scales distinctly larger than the dorsals, and the keels often so faint as to be difficult to detect.

‡ The difference in the shape of the caudal scales, as compared to the var. *campestris* (*serpa*, Schreib. part.), which Schreiber regards as one of the specific characters of *L. fiumana*, does not exist. I have never seen the keels projecting beyond the border of the scales.

This lizard shows much variation in the coloration, and some of the variations appear to be fixed in certain localities.

A. Green or olive-brown above, with brown vertebral and lateral bands spotted with black; six light, pale green or white streaks, viz. on each side, one bordering the vertebral band, one from the superciliary border to the tail, along which it extends for some distance, and one from below the eye to the side of the tail, passing through the ear, above the fore limb, and through the hind limb. Lower parts white, unspotted, or with a series of black dots on the outer row of ventrals. Specimens thus coloured (var. *striata*, Werner) are hardly distinguishable from the var. *campestris*, but, according to Werner, the head is, as a rule, more depressed ("eher platy-als pyramidocephal"). The young is olive-brown, with six very sharply defined white lines. Most of the specimens referable to Werner's var. *striata* are females, but some males agree with it, at least in having the six light lines. Specimens from Bosnia and Herzegovina are in the British Museum collection. The types of var. *striata* are from Fiume, Spalato, Ragusa, Bol, and Gelsa. Strongly striated specimens from Northern Greece have been named var. *livadiaca* by Werner.

B. Specimens in which the back is green (olive-green to bluish-green) with black spots as in the preceding, but the white lines reduced to the dorsal-lateral, have been named var. *fiumana* by Werner; they are mostly males, with bright orange-red belly and blue spots on the outer ventral shields. From Fiume, Cherso, Veglia, Brazza, Lesina. Specimens from the Istrian Karst and others from Bosnia and Herzegovina are in the British Museum. Males from Fiume, types from Dr. Werner's collection, have the belly dotted all over with black. A blue, black-edged ocellus sometimes present above the shoulder.

C. Uniform green, dark green, or reddish brown specimens without any markings (var. *imitans* Werner), similar in this respect to the Italian individuals named var. *modesta*, but with the throat and breast or the whole of the lower parts orange or red in the males at least, occur in Istria, Dalmatia, and Herzegovina, and on the islands of Lussin, Cherso, Veglia, Bua, Solta, Brazza, Lesina, Curzola, and Meleda. Some individuals, however, show more or less distinct traces of the light dorsolateral streak, whilst others with a few black spots on the sides establish the connexion with the colour-variations described above. Some male specimens from Istria, which I received alive, were of a bright grass-green on the back, of a golden colour on the head, sides, and limbs, and of a bright orange beneath.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Gorizia	53	49	26	7	26	21	27
♀ Karst	51	48	30	10	25	21–20	26
„ „	51	51	30	9	24	21–20	26
♂ Trieste	61	52	26	10	24	22–23	29
♀ „	67	51	28	10	22	17–16	26
♂ Fiume (type)	63	49	25	9	26	19–20	27
♀ „ „ **W.C.**	55	45	30	8	23	19–20	24
♂ Zeč Islet, nr. Veglia Id.	68	55	25	10	24	22–20	27
„ „ „	61	56	26	8	28	21–23	28
♀ „ „	56	55	30	10	26	21–20	26
♂ Cherso Id., Istria	60	55	27	11	25	21–22	25
„ „ „ **W.C.**	60	53	28	10	28	19–21	28
„ Lussin Id. „ „	59	53	29	12	25	22–21	28
„ Zara, Dalmatia	57	51	27	9	24	20	25
„ „ „	57	50	26	10	25	21	23
„ „ „	57	52	28	10	25	18	25
„ „ „	55	48	26	8	23	18–19	23
„ „ „	52	49	25	10	26	21–22	24
„ „ „	50	50	28	9	24	19–20	24
♀ „ „	55	52	31	11	27	17–18	25
„ „ „	52	47	30	8	20	17–18	24
„ „ „	50	53	31	9	28	22–23	28
„ Ragusa, Dalmatia, **W.C.**	55	44	29	9	20	19–18	24
„ Solta Id., „	54	51	29	11	24	21–22	26
♂ Brazza Id., „	51	51	25	11	24	22	25
♀ Bol, Brazza Id., Dalmatia, **W.C.**	55	49	28	9	25	19–21	26
♂ Lesina Id., Dalmatia	45	55	25	10	25	22–21	24
♀ „ „	46	53	29	9	29	22	23
„ Curzola Id. „	55	45	28	9	25	22–21	23
„ „ „	44	47	30	9	25	19–20	25
♂ Meleda Id. „ **W.C.**	66	58	27	8	24	21–22	29
„ Scoglio Supetar, Dalmatia, **W.C.**	61	50	26	9	24	21–22	26
♀ „ „	54	50	30	8	25	24–22	26
♂ Bosnia	61	48	25	9	21	22–23	25
♀ „	54	51	30	10	25	23–22	26
♂ Capljina, Herzegovina	55	53	25	10	24	21–20	23
♀ „ „	51	57	29	9	24	21–22	26
♂ Bukovici „	55	56	27	10	24	23–22	25

	1.	2.	3.	4.	5.	6.	7.
♀ Bukovici, Herzegovina . .	52	50	29	7	21	22–21	24
♂ Brestica „ . .	54	47	27	9	23	22	27
„ Trebinje „ . .	60	50	26	9	26	22–21	25
„ „ „ . .	54	50	26	9	24	21–19	22
„ Cettinje, Montenegro, **W.C.** .	59	53	26	9	22	22	25
♀ Njegus „ „ .	64	48	30	9	22	19	24

The seven columns as for the typical form, p. 175.

A. Klaptocz has recorded the abundance of this lizard in North Albania, in the plain in the neighbourhood of Shkodra, whilst the typical *L. muralis* alone occurs in the town itself and in the mountains up to 1000 metres altitude. The scales across the body are stated to vary between 40 and 63, the femoral pores between 15 and 25—a range of variation which exceeds that mentioned by me, and fills up the gap between the vars. *fiumana* and *melisellensis*, so far as these characters are concerned.

In Herzegovina this lizard occurs up to 1200 metres.

On the distribution, *cf.* Werner, Mitth. Nat. Ver. Univ. Wien, vi, 1908, p. 50, pl. i (map).

Var. LISSANA.

Lacerta muralis fusca, var. *lissana*, Werner, Verh. Zool.-bot. Ges. Wien, xli, 1891, p. 752, and Rept. Amph. Oesterr.-Ung. p. 51 (1897).

Lacerta litoralis, var. *lissana*, Werner, Verh. Zool.-bot. Ges. Wien, lii, 1902, pp. 383 and 384; Scherer, Bl. f. Aq. Terr.-K. xv, 1904, p. 193.

Lacerta fiumana, var. *lissana*, Werner, Mitth. Naturw. Ver. Univ. Wien, vi, 1908, pp. 45 and 46.

Lacerta muralis, var. *lissana*, Bouleng. Tr. Zool. Soc. xx, 1913, p. 172, pl. xix, figs. 8 and 9.

The lizard of Lissa, which, as recognised by Werner, is hardly separable from that of Lagosta, was first regarded as belonging to the group of the *L. muralis* typica (*fusca*, Bedriaga), but as establishing a connexion between it and the *L. fiumana*, referred at the time to Bedriaga's *neapolitana* group.

I agree that it is nearer to the var. *fiumana* than to any other, yet as it differs by an average higher number of lamellae under the fourth toe, viz. 24 to 31, usually 28, instead of 22 to 29, usually 24 to 26, as well as by an average somewhat larger size, I think it may perhaps be

kept distinct from that widely distributed form, although some specimens are hardly distinguishable.

According to Werner the Lissa lizard is never green—does not even show a trace of green. Upper parts grey or coffee-colour, the dorsal region unspotted or with dark brown spots or marblings, sometimes separated from the much spotted lateral region by a light streak; a dark vertebral streak, formed of a series of spots, which does not begin behind the occiput, but further back, about the middle of the body; in males the belly is red, without spots, except on the sides, which bear large blue spots on the outer row of ventral plates; in females it is white.

This description applies also to the lizards from Lagosta, except that the upper parts may be green, that some among them may have the dark vertebral streak originating on the nape, and that others have the markings very indistinct. The blue spots on the sides of the belly may occupy the whole outer series of shields, forming a continuous broad band.

Male specimens from Lissa, which I received alive through the great kindness of M. G. de Southoff, had the nape and the anterior part of the back light green, the upper surface of the head, the sides, the limbs, and the tail brown; two or three blue ocelli above the shoulder; large blue spots on the outer row of ventrals, in one specimen forming a continuous band; throat and belly white, or yellow tinged with orange. I have seen a few specimens (males) with small black spots on the belly.

Particulars of Specimens Examined.

			1.	2.	3.	4.	5.	6.	7.
♂	Lissa (type),	**W.C.**	65	55	28	9	28	23–24	28
,,	,, ,,	. .	61	51	25	8	24	25–24	28
,,	,, ,,	. .	52	53	26	8	24	22–24	27
,,	,, ,,	. .	52	54	25	9	29	21–24	31
,,	,,	. . .	65	54	25	8	28	24	29
,,	,,	. . .	65	53	27	9	25	24–25	28
,,	,,	. . .	65	57	26	9	22	20	24
,,	,,	. . .	58	58	26	8	24	23	24
♀	,,	. . .	55	55	30	9	25	21–23	25
,,	,,	. . .	53	60	29	9	30	21	24
,,	,,	.	58	52	25	9	25	25	28
,,	,,	. . .	58	52	26	8	23	23–24	25
♂	Lagosta	. . .	66	55	28	11	29	24–23	28
,,	,,	. . .	64	52	27	8	25	23–24	27

		1.	2.	3.	4.	5.	6.	7.
♂	Lagosta . . .	64	55	26	10	28	23	28
,,	,, . . .	62	52	26	10	25	22–23	28
,,	,, . . .	62	53	26	9	26	21–22	28
,,	,, . . .	61	52	26	9	24	22–23	27
,,	,, . . .	58	54	26	9	26	25–24	28
♀	,, . . .	53	53	28	9	25	24–23	27

Columns as on p. 175.

A description of the form and scaling would be almost entirely a repetition of that of the var. *fiumana*. I will only observe that, whereas the collar is usually feebly serrated in the specimens from Lissa, as in the var. *fiumana*, it is entire in those from Lagosta. The size is larger than usual in the var. *fiumana*. The temporal scutellation is variable, and the masseteric disc may be absent, but it is often large and in contact with the anterior upper temporal. The occipital is usually small or very small, and is sometimes pointed in front, or even separated from the interparietal—a feature which appears to be the rule in the black form occurring on Melisello. Only one specimen has 5 anterior labials, and on one side only. The scales on the back are distinctly keeled; they may slightly increase in size and completely lose the keels on the lower part of the flanks; the caudal scales are truncate rather than pointed.

Var. MELISELLENSIS.

Lacerta melisellensis, Braun, Arb. Zool. Inst. Würzb. iv, 1877, p. 49, pl. ii, fig. 4.

Lacerta muralis, var. *melisellensis*, Bedriaga, Nature, xx, 1879, p. 481; Bouleng. Tr. Zool. Soc. xx, 1913, p. 174, pl. xix, figs. 10 and 11.

Lacerta muralis fusca, var. *melisellensis*, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 197.

Lacerta muralis neapolitana, var. *merremi* (*melisellensis*), Werner, Verh. Zool.-bot. Ges. Wien, xli, 1891, p. 754, and Rept. Amph. Oesterr.-Ung. p. 44 (1897).

Lacerta serpa, var. *melisellensis*, Werner, Verh. Zool.-bot. Ges. Wien, lii, 1902, p. 386; Schreib. Herp. Eur., ed. 2, p. 454 (1913).

Lacerta litoralis, var. *lissana*, forma *melisellensis*, Scherer, Bl. f. Aq. Terr.-K. xv, 1904, p. 193, fig.

Lacerta serpa, var. *galvagnii*, Werner, Mitth. Naturw. Ver. Univ. Wien, vi, 1908, p. 49.

There are few better examples of the difficulty of discriminating between the races of *Lacerta muralis*, which are so often proclaimed

to be entitled to specific rank, than that afforded by the black lizard of the Melisello Rock near Lissa, first described by Max Braun as *L. melisellensis.*

The view entertained by Bedriaga that the Melisello lizard is a black insular race of the typical *L. muralis* (his *L. muralis fusca*) would, in the light of our present information, be highly surprising, since it has been shown that the latter does not exist on Lissa nor on any of the islands off the coast of Dalmatia. Later, however, Werner and Lehrs pronounced it to be merely a melanic form of the var. *neapolitana* (= *albiventris*), which on rocks near Capri produces the *L. cærulea* or *faraglionensis.*

My reasons for dissenting from both these views are derived from the study of the scaling, to which previous authors had not paid sufficient attention when making their comparisons.

In describing the lizard, Braun had correctly mentioned and figured the larger scales of this variety, as compared with the var. *albiventris*, and it will be seen by a glance at the tabulation that follows, that it is so, the number of scales across the body being 50 to 64 (usually less than 60) in the Melisello lizard, and 62 to 75 in the var. *neapolitana* from the East Coast and islands of the Adriatic. The number of dorsal scales would be in favour of a derivation from the typical *L. muralis*, but against this we have the greater number of subdigital lamellæ under the fourth toe (25 to 30, usually 28). In these numbers, however, we have so complete an agreement with the lizard described as var. *lissana* (Sc. 51–54, lam. 27–31, usually 28), that, when I became acquainted with it, I at once felt convinced as to the relationship of the two forms, as had already been pointed out by Scherer in 1904. All doubts as to the derivation of the var. *melisellensis* from the var. *fiumana* are removed by an examination of the lizards from Lissa and Lagosta, which furnish the missing link.

In the following table particulars are given of the 19 specimens from Melisello examined by me. The two first specimens form part of the series out of which Braun's original types were obtained; the last 8 belong to Dr. Werner's Collection, the rest being in the British Museum.

	1.	2.	3.	4.	5.	6.	7.
♂	50	52	25	10	27	23–22	29
♀	58	54	29	8	27	25–23	25
♂	73	62	28	10	27	22–24	28
,,	68	59	25	9	29	23	28
,,	65	64	24	11	29	22–23	30
,,	65	63	26	11	32	23	28

	1.	2.	3.	4.	5.	6.	7.
♂	65	60	25	10	31	27	28
,,	63	60	25	10	29	22–23	30
,,	63	57	26	8	25	23–24	28
,,	61	58	26	9	28	23	28
♀	56	56	27	8	26	21–22	28
♂	74	58	24	10	29	22	27
,,	70	55	25	9	30	23–24	30
,,	65	52	25	8	28	24–23	?
,,	60	56	26	9	30	24	28
,,	58	52	25	10	26	23–24	29
♀	60	50	28	8	30	24–23	28
,,	59	53	29	8	27	24–23	27
,,	55	50	30	9	29	22–21	?

Columns as on p. 175.

The size is often larger than in the var. *lissana*, but the proportions are the same except that the head may be a little larger and the hind limb reaches the shoulder or the collar in males, the elbow of the adpressed fore limb or the axil in females. The dorsal scales are usually less distinctly keeled, and those on the flanks are always smooth; 35 to 48 scales on the middle of the back correspond to the length of the head. Collar sometimes entire, sometimes feebly serrated. First and second superciliaries in contact with the first supraocular. Masseteric disc large and often in contact with the upper temporal. 5 anterior upper labials in 10 per cent. of the specimens examined (on one side in six specimens, on both sides in one). This insular form has a tendency to lose the occipital shield, in fact it is entirely absent in the first and fifth specimens of the above list; it is small and separated from the interparietal in 13 out of the 19 specimens examined, in which case the parietals form a short median suture, small and just touching the interparietal in 3, forming a narrow suture with the interparietal in 2.

Dark brown to nearly black above, with the markings of the var. *lissana* more or less distinct—at least in certain lights. Females have a black vertebral streak, sometimes light-edged, and a light dorso-lateral streak extends from the superciliary edge to the tail; males have more the style of markings shown by the specimens from Lagosta. The lower parts are black, or of a blackish steel blue, with pale blue spots on the sides; in the males these blue spots are large and often form a continuous band along the outer row of ventral plates, in females they are small or very indistinct. The broken tail

is sometimes regenerated black or blackish, but more often brown above and whitish beneath.

According to Scherer, the young do not differ in colour from the lizards of Lissa.

Specimens from the Scoglio Kamik, west of St. Andrea, near Lissa, have been named by Werner var. *galvagnii*. They differ from the Melisello lizards in the absence of blue on the sides of the belly, being uniform black or blackish. By their heavy form and thick tail they remind one of the var. *lilfordi* melanos, but the scaling is the same as in var. *melisellensis*, as the following tabulation of the two type-specimens shows:

	1.	2.	3.	4.	5.	6.	7.
♂	72	54	26	10	27	25–26	28
,, ...	70	53	27	10	28	24	29

In both specimens the occipital is small and separated from the interparietal; in the larger the masseteric disc is small on one side and absent on the other.

The black lizard from St. Andrea is alluded to further on, under the var. *albiventris*, from which it is perhaps derived.

Var. SERPA.

Lacerta serpa, Rafinesque, Caratt. alc. n. Gen. Anim. p. 8 (1810).*

Podarcis muralis siculus, Bonap. Icon. Faun. Ital., Amf. (1836).

Lacerta taurica, part., Dum. & Bibr. Erp. Gén. v, p. 225 (1839).

Lacerta muralis neapolitana, part., Bedriaga, Arch. f. Nat. 1878, p. 285, Bull. Soc. Zool. France, 1879, p. 202, Arch. f. Nat. 1879, p. 274, and Abh. Senck. Ges. xiv, 1886, p. 220.

Lacerta muralis fusca, part., Bedriaga, Abh. Senck. Ges. xiv, p. 181.

Podarcis muralis, var. *sicula, rubriventris, doderleinii*, De Betta, Atti Ist. Ven. (5), v, 1879, p. 389.

Lacerta muralis punctato-fasciata, part., Eimer, Arch. f. Nat. 1881, p. 352.

Lacerta serpa, part., Camerano, Mon. Saur. Ital. p. 56 (1885); Schreib. Herp. Eur., ed. 2, p. 444 (1912).

Lacerta muralis, var. *tiliguerta*, part., Bouleng. Cat. Liz. iii, p. 30 (1887).

* Whilst holding Bonaparte's *P. siculus* to be a strict synonym of *L. serpa* of Rafinesque, I am in doubt whether to refer the latter author's *L. sicula* to *L. viridis* or to *L. muralis*, var. *tiliguerta*. The length of Rafinesque's *L. sicula*, viz. 10 French inches = 270 millim., seems to exclude the present form, which is not known to exceed 220 millim.

Lacerta sicula, Scherer, Bl. f. Aq. u. Terr.-K. xiv, 1903, pp. 277, 288, fig.

Lacerta muralis, var. *serpa*, part., Boulenq. Tr. Zool. Soc. xvii, 1905, p. 394, pl. xxvii, fig. 7, and xx, 1913, p. 155.

Lacerta serpa, var. *doderleini*, Schreib. op. cit. p. 456.

The bright green wall-lizard of Sicily, on which the name *Lacerta serpa* was bestowed by Rafinesque, has usually been associated with the green varieties of Italy under the name of *serpa* or *neapolitana*, but I am now of opinion that it should stand as a distinct variety, bearing considerable resemblance to *L. taurica*, to which it was referred by Duméril and Bibron, and also to the var. *fiumana*, as first pointed out by Scherer. It differs from the latter form principally in the larger head of males, the longer hind limbs, and smaller scales on an average, whilst the longer digits have a higher average number of scales on the lower surface. As pointed out by Eimer its pattern of markings is highly suggestive of the typical *L. muralis* of C. Europe, and when the green colour is absent the superficial resemblance is great indeed.

Head $3\frac{2}{3}$ to 4 times in length to vent in males, 4 to $4\frac{1}{2}$ times in females, $1\frac{1}{2}$ to $1\frac{4}{5}$ times as long as broad, usually rather convex above, its depth equal to the distance between the anterior corner or the centre of the eye and the tympanum; snout obtusely pointed, as long as the postocular part of the head; pileus 2 to $2\frac{1}{4}$ times as long as broad. Body moderately depressed. The hind limb reaches the collar or between the collar and the ear in males, the elbow, the axil, or the shoulder in females; foot $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as head. Tail $1\frac{4}{5}$ to $2\frac{1}{5}$ length of head and body.

Rostral shield usually entering the nostril or narrowly separated from it; nasals forming a suture behind the rostral*; frontal as long as its distance from the rostral or the end of the snout; parietals $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, in contact with the upper postocular; occipital always shorter than the interparietal and often a little broader, sometimes minute or reduced to a granule, or separated from the interparietal by a small shield; a series of granules between the supraoculars and the superciliaries, which number 5 or 6, first usually longest and forming an oblique suture with the second, the series of granules sometimes complete, sometimes incomplete or much reduced (5 or 6); 4, rarely 5, upper labials anterior to the subocular, the lower border of which is much shorter than the upper; temporal scales small, usually with 3 to 5 more or less enlarged but narrower upper temporals, the first of which is the longest; masseteric shield

* In one male the rostral forms a suture with the frontonasal.

usually present, large or small.* 22 to 30 scales and granules between the symphysis of the chin-shields and the median collar-plate; gular fold very distinct. Collar with even or feebly serrated edge, composed of 8 to 12 plates.

Pterygoid teeth exceptionally present.

Scales on the back granular or oval-hexagonal, more or less distinctly keeled, not larger than those on the sides, which are smooth or very feebly keeled: 50 to 67 scales across the middle of the body, usually 57 to 63; 3 or 4 transverse series of scales on the side correspond to a ventral plate, 36 (♀) to 51 (♂) in the middle of the back, to the length of the head. Ventral plates in 6 longitudinal and 25 to 30 transverse series—25 to 28 in males, 28 to 30 in females; the plates of the second series from the median line the broadest. Preanal plate moderately large, bordered by two semicircles of small plates, rarely by one.

Scales on upper surface of tibia keeled, smaller than dorsals. 27 to 33 lamellar scales under the fourth toe, usually 28 to 30. 18 to 23 femoral pores on each side, usually 19 to 22.

Caudal scales more or less oblique, the upper diagonally keeled, with truncate or obtusely pointed posterior border, the lower, at the base, smooth or faintly keeled; the whorls often very unequal in length; 26 to 38 scales in the fourth or fifth whorl behind the postanal granules.

Coloration: Males bright green above, with a more or less distinct light dorsolateral streak usually bordered on the inner side by a series of small or moderately large black spots; a vertebral series of small or moderately large black spots usually present; sides with numerous black spots or reticular marblings enclosing light spots, or with a series of ocellar spots. Belly white, orange, or brick-red, without spots, or white with a brick-red spot, on each of the plates except the outer, which are always blue and rarely spotted with black.

Females bright green, olive, or pale brown above, with a white, sometimes dark-edged dorsolateral line, a dark-brown or reddish brown lateral band edged below by another white streak, from the upper lip to the thigh, the dark band sometimes speckled with darker or with round light spots; a vertebral series of small dark spots sometimes present all along the back or only posteriorly. Belly white or pink,† the outer ventral plates blue or bluish.

The head is unspotted or with very small black spots or dots; the tail may be variegated with dark and light spots, sometimes forming

* Absent in two specimens.

† Sometimes of a "rosso deciso" according to Camerano.

cross-bars, in males, or bear a dark, light-edged lateral streak in females and rarely in males; one or two blue ocellar spots may be present above the axil; limbs often with round light spots.

The coloration is, in some cases, absolutely the same as that of certain specimens of the var. *fiumana*, and some females closely resemble striated specimens of the typical form.

Particulars of Specimens Examined.

	1	2.	3.	4.	5.	6.	7.
♂ Monte Cuccio, nr. Palermo .	72	67	26	12	28	21–23	28
„ „ „ „ .	67	58	27	9	25	22	29
„ „ „ „ .	66	60	25	10	26	23–21	31
„ „ „ „ .	66	50	28	9	22	20–19	29
„ „ „ „ .	64	59	27	10	24	22	29
♀ „ „ „ .	68	64	28	11	26	20–21	33
„ „ „ „ .	64	57	29	9	23	20	27
„ „ „ „ .	62	59	28	9	24	20–22	29
„ „ „ „ .	57	63	30	10	27	21–20	30
„ „ „ „ .	57	58	28	11	22	20	29
♂ Bosco di Marineo, Palermo .	70	65	27	11	25	22–23	30
„ „ „ .	63	63	25	10	29	21–22	30
♀ „ „ .	64	60	29	9	27	21–19	30
♂ Palermo	62	58	25	8	26	19–20	28
„ „ W.C. . . .	70	66	26	12	30	20–22	30
„ „ „ . . .	68	57	26	8	26	21–20	29
„ „ „ . . .	67	60	25	10	23	21–20	30
„ „ „ . . .	62	61	25	9	22	18–19	29
♀ „ „ . . .	63	62	28	9	25	22	29
„ „ „ . . .	62	59	28	9	26	20	29

Columns as on p. 175.

This variety is confined to Sicily. All the specimens I have seen are from Palermo and its vicinity.

Var. CAMPESTRIS.

Podarcis muralis, var. *campestris*, De Betta, Atti Acc. Verona, xxxv, 1857, p. 152, Faun. d'Ital., Rett. Anf. p. 28 (1874), and Atti Ist. Venet. (5) iv, 1878, p. 897, and v, 1879, p. 388.

Lacerta tiliguerta, De Filippi, N. Ann. Sc. Nat. Bologna, (3) v, 1862, p. 69.

Lacerta muralis, var. *campestris*, Leydig, Deutschl. Saur. p. 228 (1872); Eimer, Zool. Stud. Capri, ii, p. 25, pl. ii, fig. 3 (1874);

Bouleng. Tr. Zool. Soc. xvii, 1905, pp. 390, 405, pl. xxvii, figs. 1 and 2, and xx, 1913, p. 178, pl. xx, figs. 3–5.

Lacerta muralis striata, part., Eimer, Zool. Stud. Capri, ii, p. 25.

Lacerta muralis neapolitana, vars. *campestris* et *livornensis*, Bedriaga, Arch. f. Nat. 1879, pp. 274, 279, and Abh. Senck. Ges. xix, 1886, pp. 223, 225.

Lacerta muralis striata campestris, Eimer, Arch. f. Nat. 1881, p. 328, pl. i, figs. 1 and 2.

Lacerta muralis maculato-striata, part., Eimer, t.c. p. 336.

Lacerta serpa, part., Camerano, Mon. Saur. Ital. p. 56, pl. i, fig. 36 (1885); Schreib. Herp. Eur., ed. 2, p. 444 (1912).

Lacerta muralis, part., Camerano, op. cit. p. 30, pl. i, fig. 39.

Lacerta muralis, var. *tiliguerta*, part., Bouleng. Cat. Liz. iii, p. 30 (1887).

Lacerta muralis, var. *multifasciata*, Positano Spada, Bull. Soc. Rom. Zool. i, 1892, p. 154, fig.

Lacerta muralis neapolitana, vars. *olivacea* et *merremii*, part.,* Werner, Rept. Amph. Oesterr.-Ung., p. 43 (1897).

Lacerta serpa, Werner, Verh. Zool.-bot. Ges. Wien, lii, 1902, p. 382.

Lacerta serpa, var. *subcampestris*, Schreib. op. cit. p. 452.

Head $3\frac{1}{2}$ to 4 times in length to vent in males, 4 to 5 times in females, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, moderately depressed, its depth in the tympanic region equal to the distance between the anterior corner of the eye and the anterior border of the tympanum; snout obtuse, as long as or a little longer than postocular part of head. Neck as broad as or a little narrower than the head. Body moderately depressed. Hind limb reaching the shoulder, the collar, or a little beyond the collar in males, the axil or the elbow of the adpressed fore limb in females; foot $1\frac{1}{6}$ to $1\frac{1}{3}$ times the length of the head. Tail cyclo-tetragonal at the base, then cylindrical, $1\frac{3}{5}$ to a little over 2 times as long as head and body.

Rostral shield narrowly separated from the nostril or, not rarely, entering it†; nasals always forming a suture behind the rostral; frontal usually as long as its distance from the end of the snout, sometimes considerably shorter; a series of granules between the superciliaries and the two principal supraoculars, the first of which is usually in contact with the first superciliary, rarely with the second

* Non *L. merremia*, Risso (= *L. muralis* typica). *L. merremii*, Fitzinger, is a *nomen nudum* which has been used by Erber (Verh. Zool.-bot. Ges. Wien, xviii, 1867, p. 855), Bedriaga, Werner and others in different senses.

† Two postnasals on one side in a male from Zara.

also, the granules sometimes reduced to 3 or 4*; in a few specimens the series of granules beginning from the first supraocular†; parietals $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad, usually in contact with the upper postocular, but sometimes not‡; occipital very variable, usually shorter but often broader than the interparietal. Nearly constantly 4 upper labials anterior to the subocular,§ which is narrower beneath than above; temporal scales usually larger than in an average typical *L. muralis*, with the tympanic shield always distinct and the masseteric frequently so; enlarged upper temporals narrow or absent. 21 to 32 scales and granules between the symphysis of the chin-shields and the median collar-plate; gular fold very distinct; collar more or less distinctly serrated, sometimes as much as in *L. agilis*, composed of 9 to 11, rarely 7 or 8, plates.

Scales on the back roundish-hexagonal or oval-hexagonal, very distinctly, often sharply keeled, the vertebral line usually with a more or less regular band of much smaller granular scales; lower lateral scales as large as or a little smaller or a little larger than the dorso-laterals, smooth or faintly keeled; 50 to 67 scales across the middle of the body, usually 53 to 62; 3 or 4 transverse series of scales correspond to one ventral plate, 33 to 50 to the length of the head. Ventral plates in 6 longitudinal‖ and 23 to 31 transverse series (23–29 in males, 27–31 in females). Preanal plate frequently rather small, with 2 or 3 semicircles of small plates, but sometimes large and with a single semicircle. Scales on upper surface of tibia smaller than dorsals, more or less strongly keeled; 23 to 30 lamellar scales under the fourth toe, usually 25 to 29; 15 to 24 femoral pores on each side, usually 17 to 22.

Upper caudal scales strongly keeled and usually obtusely but distinctly pointed behind, those on the sides oblique and diagonally keeled; 30 to 40 scales in the fourth whorl behind the postanal granules.

Typical examples of the var. *campestris*, as represented by specimens from Venetia, the Po Valley, and Istria, have the upper surface of the head, a vertebral band, the sides of the body and limbs, and the

* Specimens from Sansego and Zara.

† Specimens from Venice, Bologna, L. Trasimene, Florence, Montecristo, Grado, Zara.

‡ In 4 specimens from Turin, in 2 from L. Trasimene, in 5 from Castelfranco, and in 3 from Sansego.

§ 5 on one side in single specimens from Venice, Auversa, and L. Trasimene, 3 on one side in a specimen from Florence, in another from Viareggio nr. Pisa, and on both sides in one from Ancona and in one from Corsica.

‖ The outer ventral plates are divided into two in a female from L. Trasimene.

upper surface of the tail pale brown or olive brown, the sides of the back bright grass-green; the brown, often light edged, vertebral band bears two parallel series of small black spots, or a single straight or zig-zag series of large black spots; these spots, as a rule, do not begin until some way behind the occiput or nape; the sides, in females, bear two more or less distinct, straight or wavy, whitish streaks (the upper proceeding from the superciliary border, the lower passing through the ear), which may be edged with black or bordered by small black spots, whilst in adult males they are spotted with black and white, the spots often forming ocelli; a large black spot or an ocellus with blue or green centre often present above the axil; black spots on the upper surface of the head present or absent; white black-edged spots on the hinder side of the limbs. Large male specimens have the upper surface of the head bright green. Lower parts white, greenish, yellowish, or reddish, without spots, or with a series of black spots on the outer row of ventral plates, which may also bear blue or green spots, usually of small size. The young are always very distinctly streaked, and the two green streaks are narrower in proportion to the brown areas.

Further specimens answering to the above description occur in other parts of Italy, as far south as Rome, in Elba and Corsica, and in Northern Dalmatia. More aberrant colour-variations are the following:

Green colour absent, or reduced to a narrow streak on each side of the vertebral stripe (males and females from Turin and Trieste).

Olive above, with three reddish brown stripes, but no spots (female from Turin).

Pale brownish grey, with a pale green stripe on each side of the ventral line; a trace of a whitish dorsolateral streak; no spots (female from the sandy shore at Ostia, near Castelfranco).

Uniform greyish olive (Sansego, var. *olivacea* of Werner).

Green above, with three dorsal series of large black blotches (Rome, Florence, Zara).

Five black stripes along the body, with narrow light streaks between them (var. *multifasciata*, Positana Spado, from Ponte Salerio, near Rome).

Green above, with a dorsolateral series of large black spots; another lateral series of large black spots from axil to groin, and a third on the outer row of ventral plates, which are blue; no vertebral stripe or series of spots (var. *livornensis*, Bedr., from Calambrone, near Leghorn).

Particulars of Specimens Examined.

ITALY:	1.	2.	3.	4.	5.	6.	7.
♂ Verona	70	60	25	9	24	19 18	25
„ „	63	57	26	11	23	18	25
♀ Venice	67	54	30	11	23	17	24
„ „	50	57	28	11	30	19	28
„ Lido	52	57	30	9	27	19–18	27
♂ Treviso	76	61	27	9	25	21	27
„ „	72	58	27	9	25	20 19	26
„ „	70	59	27	11	29	20–21	29
„ „	70	57	28	11	32	21	25
♀ „	62	54	30	11	25	20	29
♂ Turin	64	55	28	9	22	17	27
„ „	58	58	29	11	30	18 16	28
„ „	58	58	26	10	21	18 17	24
„ „	50	61	28	9	23	20	26
♀ „	60	53	32	9	23	17	27
„ „	59	62	30	10	26	17–18	28
„ „	56	58	31	8	24	15 16	24
„ „	55	63	30	9	23	16	24
♂ Bologna	69	61	26	10	23	17–18	29
„ „	67	61	24	11	23	22–21	27
♀ „	52	61	29	10	25	20 19	26
♂ Viareggio, nr. Pisa	74	61	26	9	25	19	28
„ Florence (Bedriaga)	76	63	25	10	29	21–20	26
„ „ („)	73	63	26	11	26	20 19	26
♀ „ („)	63	59	29	11	25	21	28
„ „ („)	63	58	30	8	24	19–18	27
♂ „ (Florence Mus.)	67	57	23	11	23	21–20	26
♀ „ („)	64	56	29	10	23	18–19	26
„ „ (Southoff)	64	62	30	10	26	20 23	23
♂ Calambrone (type of var. *livornensis*)	74	64	26	9	25	19 20	30
„ Ancona	65	60	25	10	22	20	25
„ Perugia	63	61	25	11	25	20	24
♀ „	63	58	28	11	25	19	24
♂ L. Trasimene, Perugia	82	61	26	10	25	22–23	27
„ „ „	68	62	26	10	25	22 19	27
♀ „ „	70	61	30	11	28	21	30
„ „ „	68	58	30	10	27	22	30
♂ Castelfranco	77	65	25	8	27	22 20	29
„ „	70	60	27	10	23	18	27

	1.	2.	3.	4.	5.	6.	7.
♂ Castelfranco . . .	68	58	26	11	27	24–23	29
♀ „ . . .	61	56	30	11	23	18	26
♂ Rome	66	63	28	11	26	21–19	30
♀ „	55	52	29	9	22	20–18	25
„ Autrodoco, Abruzzi . .	71	60	28	9	26	18–20	26
♂ Auversa „ . .	78	56	27	11	26	21	23
„ „ „ . .	70	59	27	10	28	20–21	?
„ Alfedena „ . .	65	61	25	11	25	19	24
„ Assergi „ . .	60	60	26	9	23	17–18	26
„ Montecristo Id. . . .	53	57	25	11	27	21–22	28
„ Elba	64	58	26	10	26	19–17	26
Corsica:							
♀ Corsica	69	52	27	11	24	18–19	25
Istria and Dalmatia:							
♂ Grado, **W.C.** . . .	63	61	26	11	26	21–20	27
„ Trieste „ . . .	71	62	25	11	25	18	27
„ „	70	53	28	9	25	17–18	25
„ „	68	62	26	10	27	18 19	27
♀ „ **W.C.** . . .	65	59	27	11	24	17–19	27
„ „ „ . . .	57	62	30	9	26	17–18	26
♂ Capo d'Istria, **W.C.** . .	63	58	27	11	26	22–23	29
„ Pola, **W.C.**	80	53	27	11	25	18	27
„ „	72	53	27	11	24	20–19	27
? „ **W.C.**	65	54	29	11	22	17–18	28
♂ Sansego Id., **W.C.** . .	69	60	27	11	24	20–19	29
„ „ „	68	59	26	11	26	20 19	28
„ „ „ **W.C.** . .	67	62	27	11	28	23–24	29
„ „ „	63	62	25	10	25	22	29
„ „ „ **W.C.** . .	60	57	26	11	25	19–21	28
„ „ „ „ . .	58	59	25	10	26	20–17	26
♀ „ „ „ . .	63	61	29	10	25	19	28
„ „ „	63	58	29	9	25	20–19	27
„ „ „	58	59	29	10	24	20	29
„ „ „ **W.C.** . .	56	58	30	9	22	17–18	28
♂ Lusin Id., „ . . .	72	55	26	11	25	20–18	29
♀ „ „ . . .	67	50	30	9	27	18–19	29
♂ Zara	78	58	26	10	24	18–19	27
„ „	78	56	27	9	27	19–21	26
„ „	77	60	26	11	24	18–17	25
„ „	74	66	29	11	27	22–20	27
„ „	73	61	28	12	25	23–24	28

	1.	2.	3.	4.	5.	6.	7.
♂ Zara	73	55	27	10	27	20–21	25
„ „	65	67	25	11	27	24–22	27
♀ „	75	58	31	9	28	23	29
„ „ W.C.	70	54	29	11	28	18	26
„ „ „	69	57	29	9	25	20–21	29
„ „	68	61	29	7	21	20	25
„ „ . . .	60	56	28	9	23	19	26
„ „	56	56	30	8	26	18–19	27
„ „	49	53	28	10	22	18	25

Columns as on p. 175.

Habitat.—Italy from Venetia and the Po Valley to Rome and the Abruzzi; Elba, Montecristo and Corsica; Eastern Coast and islands of the Adriatic as far south as Northern Dalmatia.

Var. ALBIVENTRIS.

Podarcis muralis albiventris, Bonap. Icon. Faun. Ital., Amf. (1836).

Lacerta muralis, vars. h, i, j, part., Dum. & Bibr. Erp. Gén. v, p. 234 (1839).

Lacerta muralis cærulea, Eimer, Verh. phys.-med. Ges. Würzb. iii, 1872, Sitzb. p. ix, and Zool. Stud. Capri, ii, p. 5, pl. i (1874).

Lacerta muralis neapolitana, Bedriaga, Entsteh. d. Farb. b. d. Eidechs. p. 15 (1874).

Lacerta faraglionensis, Bedriaga, op. cit. p. 16, pl., and Die Faraglione-Eidechse (1876).

Lacerta muralis, vars. *striata*, part., *elegans*, *modesta*, *maculata*, Eimer, Zool. Stud. Capri, ii, p. 24, pl. ii.

Lacerta muralis neapolitana, part., Bedriaga, Arch. f. Nat. 1878, p. 285, Bull. Soc. Zool. France, 1879, p. 202, Arch. f. Nat. 1879, p. 274, and Abh. Senck. Ges. xiv, 1886, p. 220.

Lacerta muralis, vars. *faraglionensis*, *latastii*, *viridiocellata*, Bedriaga, Bull. Soc. Zool. France, 1879, pp. 207, 209, 211, pl. ix, fig. 4.

Podarcis muralis, vars. *albiventris*, *maculata*, *faraglionensis*, De Betta, Atti Ist. Ven. (5) v, 1879, pp. 389–393.

Lacerta muralis maculata, *reticulata*, part., *concolor*, part., *cæruleo-cærulescens*, *cærulescens monaconensis*, *cærulescens gallensis*, Eimer, Arch. f. Nat. 1881, pp. 375–389, pls. xiii–xv.

Lacerta serpa, part., Camerano, Mon. Saur. Ital. p. 56 (1885); Schreib. Herp. Eur., ed. 2, p. 444 (1912).

Lacerta muralis neapolitana, vars. *albiventris*, *pelagosæ*, Bedriaga, Abh. Senck. Ges. xiv, 1886, pp. 223, 227.

Lacerta muralis, var. *tiliguerta*, part., Bouleng. Cat. Liz. iii, p. 30 (1887).

Lacerta muralis neapolitana, var. *merremii*, part., Werner, Rept. Amph. Oesterr.-Ung. p. 43 (1897).

Lacerta serpa, var. *pelagosæ*, Werner, Verh. Zool.-bot. Ges. Wien, lii, 1902, p. 384.

Lacerta serpa, var. *adriatica*, Werner, t.c. p. 386.

Lacerta muralis, var. *serpa*, part., Bouleng. Tr. Zool. Soc. xvii, 1905, p. 394, pl. xxiii, fig. 2, and pl. xxvii, figs. 3 and 4, and xx, 1913, pp. 148, 180, pl. xx, figs. 6–9.

Lacerta serpa, var. *cazzæ*, Schreib. op. cit. p. 454.

? *Lacerta serpa*, var. *argus*, Schreib. op. cit. p. 455.

In Southern Italy and in Dalmatia this form replaces the preceding, more northern variety, with which it is so completely linked as to render the naming of certain specimens arbitrary.

It is, as a rule, a larger form, in some respects differing less from the typical *L. muralis*. The occiput is usually flatter, the temporal scales are smaller, more granular, the collar has the edge even, or, if feebly serrated, less distinctly so, the subdigital lamellæ are more numerous on an average, the caudal scales are usually narrower, less oblique, and more truncate posteriorly, their posterior border rarely forming a well-marked angle, the scales on the body are smaller on an average; and finally, the rostral shield very rarely touches or enters the nostril.

Head $3\frac{1}{2}$ to 4 times in length to vent in males, 4 to $4\frac{1}{2}$ times in females, $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, usually flat on the occiput, its depth equal to the distance between the anterior corner or the centre of the eye and the tympanum; snout obtusely pointed, as long as or a little longer than the postocular part of the head. Pileus 2 to $2\frac{1}{3}$ times as long as broad. Body moderately depressed. The hind limb reaches the shoulder, the collar, or between the collar and the ear in males, the elbow or the axil in females; foot once and one sixth to once and a half the length of the head. Tail $1\frac{2}{3}$ to $2\frac{1}{5}$ length of head and body.

Rostral shield separated from the nostril, with rare exceptions*: nasals forming a suture behind the rostral†; frontal as long as or shorter than its distance from the end of the snout; 6 superciliaries,

* 3 males from Monte Gargano.

† Except in a male from Rome.—2 postnasals on right side in a male from Pompeii, on both sides in a female and on left side in a male from the Faraglioni Rocks and in a female from Pompeii.

rarely 5 or 7, first longest and forming an oblique suture with the second; series of granules between the supraoculars and the superciliaries rarely complete, the first superciliary usually, the second sometimes, in contact with the second supraocular*; parietals 1½ to 1⅔ times as long as broad, usually in contact with the upper postocular†; occipital sometimes very small, but often as long as and broader than the interparietal,‡ from which it may be separated by a small shield§; 4 upper labials anterior to the subocular, rarely 5‖; subocular much narrower beneath than above; temporal scales small, often granular, with the tympanic shield always distinct and the masseteric usually so, often large¶; enlarged upper temporals narrow, 3 to 6 in number, sometimes hardly distinguishable in size and form from the other temporal scales.

24 to 38 (usually 25 to 36) scales and granules between the symphysis of the chin-shields and the median collar-plate; gular fold very distinct. Collar not or but very feebly serrated.

Pterygoid teeth rarely present.

Scales on body very small, convex, round or oval-hexagonal, more or less distinctly keeled, sometimes smaller still and irregularly disposed on the vertebral line; 55 to 78 scales across the middle of the body, usually 63 to 75; 3 or 4, or 4 or 5 transverse series correspond to a ventral plate, 35 (♀) to 55 (♂) to the length of the head. Ventral plates in 6** longitudinal and 23 to 32 transverse series (23–28 in males, 26–32 in females); in the middle of the belly the plates of the median pair sometimes as broad as the others.†† Preanal plate moderately large or rather small, bordered by two or three semicircles of smaller plates or scales.

Scales on upper surface of tibia keeled, usually smaller than dorsals.

* Granules reduced to 5 in two specimens from Scoglio Sušać and in one from Ponza Id. Series complete in a female from Ischia, male and female from Procida, male from Gianuti, male from Casamicciole, female from S. Nicola.

† Exceptions in a male from Ponza Id. (v. *latastii*), and in a female from Pompeii.

‡ Longer and broader in a male from Rome and in a female from Scoglio Sušać. Completely absent in a male from Gianuti.

§ Males from Rome and Monte Gargano, females from Ponza.

‖ On both sides in males from Pelagosa Grande and S. Nicola, in females from Pompeii and Pelagosa Piccola, on right side in a male from Arbe Id. and in a female from the Faraglioni.

¶ Absent in a specimen from Capri and in two from the Faraglioni.

** Exceptionally 8, according to Eimer and Bedriaga, in specimens from the Faraglioni.

†† A feature of very exceptional occurrence in the other varieties.

25 to 36 lamellar scales under the fourth toe, usually 28 to 33. 19 to 28 femoral pores on each side, usually 20 to 25.

Caudal scales usually narrow and straight, sometimes more or less oblique, upper strongly keeled, truncate, rarely obtusely pointed; the whorls not very unequal in length, the fourth or fifth containing 28 to 38 scales.

Coloration very variable, even in specimens from the same locality. Some individuals, females and young, closely agree in colour and markings with the striated var. *campestris*, but the more frequent and characteristic pattern consists of agglomerations of black spots on the vertebral line and on the sides, forming three bands (var. *striata*, Eimer), which may be spotted with white; others are irregularly spotted or reticulated with black (vars. *elegans*, *maculata*, Eimer), or the black spots may form cross-bars on the sides, or even on the posterior part of the back. The colour of the back varies from greyish brown to olive, grass-green, or bluish green; the sides are usually brown, rarely green. Some specimens* show only faint traces of darker markings, and lead to others which are uniformly olive or yellowish brown (vars. *modesta*, *concolor*, Eimer). A blue or green ocellar spot is often present above the axil, and may sometimes attain a large size. The tail is brown and usually bears bars of black and white spots on the sides, sometimes extending across the upper surface, sometimes interrupted by a dorsal series of large black spots. The limbs often with round light, black-edged spots. Upper surface of head brown, rarely olive green, sometimes much spotted with black.

The lower parts are usually white, the throat often bluish, with blue and black spots on the outer ventral plates; exceptionally the adjacent ventrals may also be spotted with black,† or the belly may be grey, appearing as if powdered with black pigment when examined under a magnifying glass.‡

A remarkable specimen from Cosenza, Calabria, preserved in the

* From Rome, Ponza, Ventotene, and Vivara Ids.—These are specially mentioned in view of Eimer's statement (Capri, p. 29), "Niemals habe ich an der *modesta* Spuren von Flecken wahrnehmen können."

† Type of var. *latastii*, from Ponza Id., the belly of which is said to have been pinkish in life.

‡ Male from Sorrento, Gulf of Naples, male and female from S. Stefano Id., near Naples; some specimens from the latter island are said, according to Bedriaga, to be nearly black above, with green spots, and blue on the belly, whilst a male specimen with black belly has been referred by me to the var. *nigriventris* on account of its strongly depressed head. Specimens with grey belly also occur in the small islands of the Adriatic, as mentioned further on.

Turin Museum, approaches the var. *nigriventris*. Body and limbs olive above, with black spots forming a wide-meshed network; no distinct ocellar spot above the axil; head much spotted with black above; a black streak along the side of the head, passing through the eye and above the tympanum, continued on the neck; tail with blackish transverse bands with sharply defined white spots on the sides; throat and belly greenish white, with small black spots.

The most remarkable colour-variation among Italian specimens is that exhibited by the lizards found on the Faraglioni rocks close to Capri (var. *cærulea*, Eimer, *faraglionensis*, Bedr.). Black or bluish black above, with more or less distinct markings of a more intense black, sapphire blue or greenish blue beneath; pale blue spots usually present on the sides; a blue or green ocellar spot above the axil. The vars. *cæruleo-cærulescens*, *cærulescens monaconensis*, and *cærulescens gallensis* of Eimer, from other small rocks near Capri, also with blue belly, are practically intermediate in the dorsal coloration between the var. *cærulea* and the lizards of Capri, which do not suffer from those found about Naples and are likewise highly variable in colour and markings. Specimens with blue belly and blue or blackish back, with or without lighter blue or green spots, are reported from the Mezzagiorno rock near Palmarola, and S. Stefano Island.

Several insular forms, of smaller size than the true var. *albiventris*, have been described from the islands of the Adriatic.

The specimens from Pelagosa Grande represent Bedriaga's var. *pelagosæ*, which is described by Werner as of a remarkably light greenish yellow or greenish white ground-colour with deep black markings; the belly is usually white, but Bedriaga describes it as sometimes blue or bluish, and Werner found it red in one specimen. Young specimens are elegantly streaked, and so are some female specimens, the markings of which may be suggestive of *Acanthodactylon vulgaris*. Males usually have a black vertebral stripe, straight or wavy, or a vertebral series of large black spots, separated from the spots on the sides by a narrower streak of the ground-colour; these spots may form longitudinal series, coarse marblings, or cross-bars.

A female 48 millim. long from snout to vent is gravid.

As regards the scaling, I note the following departures from what is normal in the var. *albiventris*. The series of granules between the supraoculars and the superciliaries is usually complete; in 5 specimens out of 18 the parietal is not in contact with the upper postocular; one specimen has 5 anterior upper labials, and two lack the masseteric shield.

The var. *adriatica* from Pelagosa Piccola is described by Werner as

distinguished by a greyish green or bluish grey ground-colour with the markings much less sharply defined, of a dark greyish brown. These markings consist of a dark vertebral stripe with round light spots, and a dark network on the sides enclosing round light spots; small dark spots on the head; belly greyish (in spirit).

The tail is rather thick in its basal part, does not taper so gradually as in other lizards of this group, as pointed out by Schreiber.

4 or 5 rows of scales correspond to one ventral plate; the dorsal scales are round granules without distinct keel; the first supraocular is normal in the male examined by me, but is broken up into two or three granules in the female; the male has four anterior upper labials on each side, the female has five; the masseteric shield is large in the male, small in the female; the collar-plates are small, as in var. *bedriagæ*.

The lizard of Cazza Island, near Lissa (var. *cazzæ*, Schreiber), comes very near to this variety as regards size and markings, which, however, may be described as black, and the belly is likewise grey. It further agrees with the specimens from Pelagosa Piccola in the small size of the collar-plates, the presence of five upper labials on both sides in one specimen and on one side in the other, and in the fine granular scaling (71–76 scales as against 60–70 in specimens from the Dalmatian mainland and Pelagosa Grande). If the var. *adriatica* be regarded as worthy of recognition, the specimens from Cazza should be referred to it.

Specimens from Scoglio Sušać, near Lissa, which I received alive from M. de Southoff, were very similar to the above, but the scales across the body number only 63 to 71. Greyish or reddish brown above, vertebral region sometimes (males) of a pale, dull green; a vertebral series of large black spots which may be confluent into a band with scalloped edges; females with 6 light lines or series of light spots; tail with black and white spots forming bars on the sides. Lower parts purplish grey to dull lilac, with turquoise-blue spots on the sides. Other specimens are very dark, almost black, above, and dark grey below, and very similar to those found on S. Stefano, near Naples.

According to Schreiber, specimens indistinguishable from the Cazza lizard occur also on St. Andrea Island near Lissa, alongside with a black form referred by him to the var. *melisellensis* of Braun, with which it is connected by numerous intermediate specimens, and also another black form described from a single example under the name of var. *argus*. More slender in habitus, with a longer and thinner tail (more than twice as long as head and body). Dark olive-brown above, black on

the head and sides, with numerous bluish-green ocellar spots irregularly disposed; blue beneath. The masseteric disc is large, surrounded by rather large scales; the dorsal and lateral scales are elongate and strongly keeled on the posterior part of the body, and only 3 correspond to a ventral plate. 24–25 femoral pores. This form seems to require careful study on a larger material, as it may be more nearly related to the var. *fiumana* than to the var. *albiventris*.

The same author (p. 453) finds complete agreement between his specimens of the var. *pelagosæ* and the lizard figured by Bedriaga as var. *latastii*, from Ponza, and he therefore unites the two under the latter name. I can see no reason for this course, which seems in contradiction with the principle set forth higher up in the same work (p. 409), "Ich selbst . . . glaube aber, dass es immerhin misslich ist, zwei in ihrer geographischen Verbreitung durch einen so weiten Zwischenraum getrennte Formen als zusammengehörend zu betrachten." *

Thanks to M. de Southoff, I have been able to examine a large number of specimens from S Nicola, Tremiti Islands, Adriatic Coast of Italy. I can see no reason for separating them from the typical var. *albiventris* from the mainland.

Particulars of Specimens Examined.

Italy:	1.	2.	3.	4.	5.	6.	7.
♂ Rome	90	76	27	10	31	25–24	30
„ „	86	73	25	10	30	26–27	33
♀ „	63	69	29	11	28	23	30
♂ Pompeii	80	60	24	9	27	25–26	31
„ „	79	66	26	10	27	20	29
„ „	70	66	24	9	27	22–23	29
„ „	59	66	23	10	26	19	30
♀ „	73	63	28	11	29	21–23	31
„ „	70	59	28	7	26	20	29
„ „	61	58	26	10	28	19–21	28
„ „	50	62	29	9	24	22–23	27
♂ San Stefano Id.	72	72	27	12	35	23	29
♀ „	70	71	30	12	37	27–26	29
„ „	60	75	27	12	36	28	33
♂ Ponza Id. (type of var. *latastii*)	71	71	24	10	31	27–28	30
„ „	62	68	25	10	33	25	31

* In the case alluded to (vars. *monticola* and *horvathi*) no one has suggested uniting the two forms under one name; their similarity is to be explained as a case of convergence such as we meet with so frequently in this species.

	1.	2.	3.	4.	5.	6.	7.
♀ Ponza Id.	66	66	29	10	32	28	33
♂ Ventotene Id.	64	66	26	10	30	26	31
♀ Ischia	67	63	29	10	30	23–22	28
♂ Vivara Id.	71	70	24	10	30	21–23	31
,, ,,	67	68	26	7	30	23–24	33
,, Procida Id.	70	65	24	9	27	22–23	32
♀ ,,	69	65	28	12	31	21–23	30
,, ,,	67	64	29	8	26	24–21	33
♂ Casamicciola Id.	74	60	25	10	27	26–27	31
,, Sorrento	67	63	25	9	25	24–25	31
♀ Capri	60	64	29	9	27	21–20	32
♂ Faraglioni	80	75	27	11	32	23–24	?
,, ,,	75	72	27	9	36	22–23	31
,, ,,	71	69	27	12	29	21–23	30
♀ ,,	74	68	30	9	29	21–22	29
,, ,,	66	66	30	11	33	23–24	30
,, ,,	65	70	29	11	30	22	30
♂ Cosenza, Calabria, **T.M.**	76	66	24	9	27	22	30
,, Reggio, Calabria	62	68	26	11	31	26–28	29
♀ ,, ,,	69	68	29	11	29	23–24	32
♂ Monte Gargano	81	55	25	9	26	21–20	28
,, ,,	77	65	26	11	26	21–20	28
,, ,,	77	64	25	13	26	22–21	28
,, ,,	75	69	26	10	30	24	30
,, ,,	72	58	25	11	27	20	28
♀ ,,	70	55	30	10	25	19–21	28
,, ,,	68	66	27	9	26	24–22	29
,, ,,	65	56	29	9	26	23–22	29
♂ Lecce, Otranto	72	57	27	9	24	19–21	28
,, ,, ,,	70	65	27	9	28	23–24	31
,, ,, ,,	70	63	26	7	25	22–21	29
♀ ,, ,,	72	60	29	10	?	23	28
East Coast and Islands of the Adriatic:							
♂ Arbe Id., Istria.	78	66	28	11	29	21	29
♀ ,, **W.C.**	66	61	32	10	28	21	27
♂ Zara, **W.C.**	80	62	26	11	26	20–21	28
,, ,,	72	70	25	9	36	23	32
,, ,,	68	63	25	10	28	23	29
♀ ,, **W.C.**	68	66	28	10	27	20–21	29
,, ,, ,,	65	64	28	9	25	20–22	28

		1.	2.	3.	4.	5.	6.	7.
♂	Spalato, **W.C.**	80	63	25	12	25	21–22	28
♀	„ „	66	60	29	10	25	22–23	32
♂	Cazza Id., near Lissa	66	75	25	11	34	24–23	30
„	„ „	63	76	26	9	31	24–25	?
„	„ „	62	71	26	11	35	20–22	28
„	Scoglio Sušać, near Lissa	73	70	26	13	29	23–22	?
„	„ „	70	71	26	13	33	21	29
„	„ „	72	70	25	11	32	22–23	28
„	„ „	68	63	25	11	33	21–22	29
„	„ „	68	69	26	10	35	23	29
♀	„ „	65	66	27	11	29	23–22	28
„	„ „	65	64	28	10	28	23–25	28
„	„ „	62	70	28	10	33	22	29
♂	Pelagosa Grande, **W.C.**	72	63	27	10	29	24–23	30
„	„	70	62	25	11	29	23–22	31
„	„	69	69	26	9	34	24–25	30
„	„ **W.C.**	69	60	25	9	28	22–23	30
„	„ „	66	66	24	7	29	23	29
„	„ „	66	60	26	9	30	21–22	29
♀	„ „	60	67	29	11	30	20–19	29
♂	Pelagosa Piccola „	70	78	27	10	38	24–25	30
♀	„ „	59	72	30	12	35	22	31
♂	S. Nicola, Tremiti Ids.	74	62	24	11	27	22–23	30
„	„ „	72	65	25	10	29	21–22	31
„	„ „	72	70	26	11	28	22–21	29
„	„ „	70	71	25	10	28	22–23	31
„	„ „	70	66	24	9	27	21–22	31
„	„ „	68	63	23	8	27	21	29
„	„ „	65	67	24	10	26	23–24	29
„	„ „	63	63	25	10	29	21	28
♀	„ „	65	62	29	9	32	20	26
„	„ „	60	62	27	10	27	23	28
„	„ „	60	61	29	10	29	20–19	28
„	„ „	57	63	26	8	25	22–23	25
„	„ „	54	60	28	9	26	21–23	29

Columns as on p. 175.

Habitat.—Italy, as far north as Rome and Monte Gargano; Dalmatia and islands of the Adriatic as far north as Arbe Island, Istria.

In the north of its range, this variety appears to merge completely into the var. *campestris*.

Var. HIEROGLYPHICA.

Lacerta hieroglyphica, Berthold, Abh. Ges. Götting. i, 1843, p. 54.

Lacerta muralis, var. *neapolitana*, Bedriaga, Bull. Soc. Zool. France, 1879, p. 206.

Lacerta serpa, Werner, Sitzb. Ak. Wien, cxi, i, 1902, p. 1082, pl. i.

Lacerta muralis, var. *hieroglyphica*, Bouleng. Tr. Zool. Soc. xx, 1913, p. 201, pl. xxi, figs. 4, 5.

A further example of the difficulty of defining races in this polymorphic lizard is offered by the specimens from the islands of the Asiatic coast of the Sea of Marmora, which have been referred by Werner to *L. serpa*. Apart from more strongly diagonal caudal scales, a character which does not seem of great importance, in view of the range of variation ascertained in the typical *L. muralis* of Central Europe,* this lizard agrees so closely with specimens of the var. *albiventris* from South Italy that I would have referred it to that form had I not been aware of the distant localities whence it was obtained. It also bears a strong resemblance to the var. *tiliguerta*. The two female specimens kindly entrusted to me by Dr. Werner show the following size and scaling (columns as on p. 175):

		1.	2.	3.	4.	5.	6.	7.
Oxia . . .	♀	65	68	29	11	28	22–21	32
Platia . . .	,,	62	71	28	9	28	22	30

Head flat above, its depth equalling the distance between the centre of the eye and the anterior border of the eye, its length once and a half or once and two thirds its width; snout pointed, as long as the postocular part of the head. The hind limb reaches the shoulder; foot once and one third or once and two fifths the length of the head. Tail nearly twice as long as head and body.

Rostral not entering the nostril; frontal nearly as long as its distance from the end of the snout; series of granules between the superciliaries and the supraoculars incomplete, the first, or first and second superciliaries in contact with the second supraocular; parietals once and one third as long as broad, in contact with the upper postocular; occipital a little shorter and a little broader than the interparietal; temporal scales granular, with a moderately large masseteric shield; upper temporal shields small (3 to 6); four anterior upper labials in the specimen from Oxia, five in that from Platia.

* Even in the var. *albiventris*, specimens with oblique, diagonally keeled caudal scales are occasionally met with, the character best marked in a female rom Monte Gargano, thus still further reducing its diagnostic value.

Collar with even edge; gular fold distinct.

Dorsal scales very small, roundish, convex, faintly keeled granules; 3 or 4 correspond to a ventral plate, 42 or 43 to the length of the head. Preanal plate rather small, with 2 or 3 semicircles of small plates; in the specimen from Platia it is followed by a series of granular scales, as sometimes occurs in the var. *albiventris*. Scales on upper surface of tibia feebly keeled, a little smaller than dorsals.

Upper caudal scales moderately keeled, truncate, very diagonal to the keel, 30 or 31 in the fourth whorl behind the postanal granules.

Greyish olive above, uniform or with very faint darker reticulation, white beneath, outer ventral shields bluish grey; a blue, black-edged spot may be present above the axil.

Werner mentions having seen quite similar lizards at Pera, near Constantinople, and he was perfectly right in regarding them as an "*olivacea*-form" of the lizard described by Berthold as *L. hieroglyphica*, from Constantinople. I was able to examine Berthold's specimens preserved in the Göttingen Museum, a half-grown male and a very young. Apart from the reticulate markings and the proportions, due to the different sex, the agreement with the Marmora Islands specimens is very close.

	1.	2.	3.	4.	5.	6.	7.
♂ . . .	48	68	25	11	34	26–24	35

The hind limb reaches a little beyond the collar. The male has 4 anterior upper labials on the right side and 5 on the left, the young has 4 on both sides. 4 or 5 dorsal scales correspond to a ventral plate, 55 to the length of the head; 34 caudal scales in the fourth whorl.

Berthold described his *L. hieroglyphica* as "supra nigra, figuris hieroglyphicis albis notata." Now somewhat bleached, the larger specimen appears olive with a wide-meshed black network, as is frequently the case in the var. *tiliguerta*; the young is also reticulate, but the markings have a tendency to dispose themselves in five longitudinal series, as in some young of var. *albiventris*.

On a visit to the Florence Museum I found several specimens labelled as from Cattaro, Dalmatia, which I refer to the same form. No importance can be attached to the locality, and the fact that the bottle in which they are preserved contains also two specimens of *Lacerta lævis*, Gray, makes it probable that they came from Asia.

	1.	2.	3.	4.	5.	6.	7.
♂ . . .	80	69	28	11	29	24–25	35
♀ . . .	80	61	30	10	24	21	32

Hind limb reaching the collar in the male. Frontal shorter than its distance from the end of the snout; occipital considerably shorter

and broader than the interparietal; masseteric disc small, absent on one side in the male. 34 or 36 caudal scales in the fourth whorl. Greyish olive above, with a darker vertebral stripe bearing small black spots; sides with round light spots in a dark network.

Measurements (in millimetres): Varieties, Group I.

	1. ♂	2. ♀	3. ♂	4. ♂	5. ♀	6. ♂	7. ♀	8. ♂	9. ♂	10. ♀	11. ♂	12. ♂	13. ♀	14. ♂	15. ♀	16. ♂	17. ♀	18. ♂	19. ♀	20. ♂	21. ♀	22. ♀	23. ♂
a.	63	55	65	64	53	50	58	72	72	66	70	60	60	78	75	90	70	75	66	70	59	65	48
b.	25	20	24	23	18	19	22	30	29	24	26	23	21	31	26	36	25	31	25	27	22	23	21
c.	15	12	16	16	12	14	13	19	19	15	17	15	13	20	15	23	16	20	15	17	13	15	14
d.	10	8	10	11	8	7	8	12	12	9	11	10	9	12	10	15	9	13	9	10	8	9	9
e.	9	6	8	8	6	5·5	6	10	9	7	10	8	7	10	8	12	7	10	8	8	6	7	7
f.	20	16	22	21	17	16	19	25	26	22	22	20	19	27	23	30	21	28	23	22	19	23	20
g.	33	36	35	34	27	26	29	37	43	37	37	34	29	44	37	51	37	45	37	38	29	39	32
h.	18	15	19	18	15	15	16	21	23	21	20	18	15	24	20	27	21	25	21	19	15	20	18
i.	117	—	130	116	95	80	—	—	155	143	128	100	102	127	120	—	134	136	122	—	—	128	112

Var. *fiumana*. 1, 2. Fiume (types).—Var. *lissana*. 3. Lissa (type). 4, 5. Lagosta.—Var. *melisellensis*. 6, 7. Melisello (types). 8. Scoglio Kamik (type of var. *galvagnii*).—Var. *serpa*. 9, 10. Palermo.—Var. *campestris*. 11. Verona. 12, 13. Turin. 14, 15. Zara.—Var. *albiventris*. 16. Rome. 17. Pompeii. 18, 19. Faraglioni. 20, 21. Pelagosa piccola (types of var. *adriatica*).—Var. *hieroglyphica*. 22. Oxia. 23. Constantinople (type).

a. From end of snout to vent.
b. From end of snout to fore limb.
c. Length of head.
d. Width of head.
e. Depth of head.
f. Fore limb.
g. Hind limb.
h. Foot.
i. Tail.

Group II.—Grecian Archipelago, Corsica, Sardinia, Malta, Linosa, Lampione, Balearic Islands.

The following insular varieties are grouped together as combining characters of the typical form and the var. *albiventris*, to either of which the three first have been referred by most authors. The group, like the others, is not capable of definition, but it agrees more with the first in the shape of the head, the collar is always even-edged, its plates often small or very small, and a dark vertebral streak or series of spots is primarily present.

The following synopsis is drawn up to be used comparatively with that of Group I.:

Var. *erhardi*, Bedr. Rostral not entering the nostril; scales smooth or faintly keeled, 54 to 63 across the body; 18 to 26 femoral pores (usually 21 to 24); 26 to 33 lamellar scales under the fourth toe; hind limb reaching axil or shoulder in males. From end of snout to vent 54 to 71 millim.—Grecian Archipelago.

Var. *quadrilineata*, Gray. Rostral entering the nostril or narrowly separated from it; scales smooth or feebly keeled, 56 to 77 across the body (usually 58 to 72); 18 to 29 femoral pores (usually 19 to 25); 27 to 34 lamellar scales under the fourth toe; hind limb reaching collar or between collar and ear in males; foot $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as head. From snout to vent 47 to 69 millim.—Corsica and Sardinia.

Var. *filfolensis*, Bedr. Rostral rarely touching the nostril; scales feebly or faintly keeled, 61 to 82 across the body (usually 64 to 80); 18 to 27 femoral pores (usually 20 to 25); 30 to 36 lamellar scales under the fourth toe (exceptionally 27); hind limb usually reaching collar or between collar and ear in males; foot $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as head; belly usually more or less spotted with black. From snout to vent 60 to 82 millim.—Malta, Linosa and Lampione.

Var. *lilfordi*, Gthr. Rostral usually narrowly separated from the nostril; scales smooth, 70 to 90 across the body; 17 to 25 femoral pores (usually 19 to 24); 27 to 32 lamellar scales under the fourth toe; hind limb reaching shoulder or collar in males, or a little beyond; foot 1 to $1\frac{1}{3}$ times as long as head; markings on the tail never forming cross-bars. From snout to vent 50 to 70 millim.—Balearic Islands (Minorca, Majorca, Cabrera).

Var. *pityusensis*, Boscá. Rostral entering the nostril, often largely; scales feebly or faintly keeled, 55 to 68 across the body; 18 to 24 femoral pores; 26 to 31 lamellar scales under the fourth toe; hind limb reaching shoulder or collar in males; foot as long as head or a little longer. Markings on the tail never forming cross-bars. From snout to vent 55 to 80 millim.—Balearic Islands (Iviza).

It appears probable that the forms of this group have been evolved on parallel lines with the typical form and the vars. *brueggemanni* and *nigriventris*.

Var. ERHARDI.

Lacerta muralis, part., Erhard, Faun. Cyclad. p. 80 (1858).

Lacerta pardalis (non Licht.), Erhard, op. cit. p. 81.

? *Lacerta muralis*, var. *archipelagica*, Bedriaga, Die Faraglione-Eidechse, p. 18 (1876).

Lacerta muralis fusca, part., Bedriaga, Bull. Soc. Nat. Mosc. lvi, 1882, p. 97.

Lacerta muralis fusca, vars. *milensis* et *erhardi*, Bedriaga, l.c. pp. 98, 99, and Abh. Senck. Ges. xiv, 1886, pp. 194 and 195.

Lacerta muralis neapolitana, part., Bedriaga, l.c. p. 99.

Lacerta muralis fusca, vars. *naxensis* et *nigrogularis*, Werner, Wiss. Mitth. Bosn. Herzeg. vi, 1899, p. 835.

Lacerta muralis, var. *erhardi*, Boulenq. Tr. Zool. Soc. xx, 1913, p. 182, pl. xxi, fig. 1–3.

The wall-lizards of the Grecian Archipelago, which I group together under the name of var. *erhardi*, whether brown or green, resemble the var. *campestris* in the shape of the head, the greatest depth of which equals the distance between the anterior corner or the centre of the eye and the tympanum; the snout is short and obtusely pointed. The hind limb reaches the axil or the shoulder in males, the elbow of the adpressed fore limb in females. Foot a little longer than head.

The rostral shield is always excluded from the nostril; the series of superciliary granules is sometimes complete, but as a rule the first, or the first and second superciliaries are in contact with the second supraocular; the parietals are only a little longer than broad, and in contact with the upper postocular; the temporal scales are usually small and granular, with distinct tympanic and masseteric shields; one, two, or three large upper temporals; occipital usually shorter and broader than the interparietal*; four is the usual number of upper labials anterior to the subocular.†

Collar not serrated, with 9 to 11 (rarely 8) plates, which may be very small; gular fold very distinct; 27 to 35 scales and granules between the symphysis of the chin-shields and the median collar-plate.

Dorsal scales small, granular, round or oval, smooth, rarely faintly keeled, equal in size, 54 to 63 across the middle of the body, 3 and 4 series corresponding to one ventral plate, 38 to 56 to the length of the head. Ventral plates in 26 to 34 transverse series (26–30 in males, 31–34 in females). Preanal plate moderate, with one or two semicircles of small plates.

Scales on upper surface of tibia feebly keeled, considerably smaller

* In a male specimen from Syra (L. Müller) the interparietal and occipital are separated from each other, the parietals forming a suture between them, as frequently happens in var. *melisellensis*; in a female from Delos a small shield separates them.

† 5 on both sides in a male from Mykonos and on one side in male from Delos. 3 on one side in a male from Petali.

than dorsals. 18 to 26 femoral pores on each side (usually 21–24). 26 to 33 lamellar scales under the fourth toe.

Upper caudal scales truncate and very obtusely, very feebly, diagonally keeled; the whorls longer and shorter alternately; 28 to 38 scales in the fourth whorl behind the postanal granules.

Specimens identical in form and scaling differ very considerably in the coloration.

The form which has been referred to *L. muralis fusca** is brown or grey above, with small black spots, which may form two or three longitudinal series on the back and reticulations on the side, the back being separated from the side by a streak of the light ground colour, which may be continued on the tail; some specimens with very small dark dots, or nearly uniform; no very distinct markings on the tail; lower parts reddish or whitish, unspotted. The largest specimen measures 69 millim. from snout to vent.

In the var. *milensis*, Bedriaga, the upper parts are pale brown, the sides yellow or greenish yellow, with black marblings often forming cross-bars; blue ocelli above the shoulder. Belly bluish, with or without large black spots, which may form longitudinal bands; throat often black with round light spots. Werner's var. *nigrogularis*, also from Milos, differs in having a black vertebral stripe or series of spots. From snout to vent 57 millim.

Bright green specimens, with the markings as in the specimens described first and with or without a black vertebral stripe have been referred by Bedriaga to *L. muralis neapolitana*. Belly white or orange. The largest measures 71 millim. from snout to vent.

Bedriaga observes that specimens from Tinos, Syra and Phanar are green on the anterior part of the back, or only on the neck, and grey-brown or greyish green on the rest of the back. In all these colour variations, large blue or blue-green spots are present on the outer row of ventrals, or the whole of the outer ventrals may be blue.

Var. *erhardi*, Bedriaga, from Seriphos, is described as similar to the first variety, but with three or four yellowish green streaks on the body, these streaks lemon-yellow on the neck; the throat lemon-yellow.

And finally, Erhard describes two further varieties: (*a*) Black above and beneath, with rows of green spots on the back (var. *archipelagica*, Bedriaga). (*b*) Reddish brown on the back and tail, green on the

* Also var. *naxensis*, Werner. The specimens before me are from Petali (Bedriaga), Tenos (Bedriaga), and Naxos (Werner). These specimens often bear a strong superficial resemblance to lizards of the var. *quadrilineata*, from Corsica.

head and neck, yellow beneath; five large cobalt-blue spots on each side of the body.* The localities for these varieties are not stated.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Petali, Eubœa . . .	63	57	28	11	34	23	29
„ Delos	67	57	27	9	34	23–22	27
♀ „	69	55	32	9	31	19–20	27
♂ Tenos, Cyclades . . .	67	57	28	10	35	21–20	30
„ Mykonos, „ . . .	71	63	29	11	35	24	28
♀ „ „ . . .	60	60	31	9	31	22	27
♂ Syra, „ . . .	65	56	27	9	30	23–22	29
„ Naxos, „ (type of var. *naxensis*) .	69	57	27	9	31	21	27
„ „ „ . . .	63	57	29	11	31	21	26
„ „ „ . . .	58	59	28	11	29	22–23	28
♀ „ „ . . .	60	59	32	11	31	22–21	29
„ „ „ . . .	57	56	34	9	32	23	29
♂ Santorin, „ . . .	63	56	27	11	32	22	29
„ „ „ . . .	62	61	28	9	33	22–23	33
„ „ „ . . .	60	55	30	11	33	21	31
„ „ „ . . .	60	60	29	11	29	23–22	29
♀ „ „ . . .	64	56	31	8	28	20–22	30
„ „ „ . . .	64	57	31	10	30	22	27
♂ Milos, „ (type of var. *milensis*) .	57	56	28	11	34	26	26
„ „ „ **P.M.** . .	58	56	26	10	31	22–23	29
♀ „ „ . . .	58	54	29	10	27	23	26
„ „ „ . .	53	56	29	9	27	22–21	28
♂ „ „ . . .	54	54	26	9	28	24	28
? Erimomilo, Cyclades (type of var. *nigrogularis*)	55	55	31	9	33	24	27
„ „ „ . . .	55	54	31	10	28	19–18	27

Columns as on p. 175.

Specimens of this variety are often difficult to distinguish from the typical *L. muralis*. In such cases the higher number of transverse rows of ventral plates (26 to 30 in males and 31 to 34 in females) and of gular scales in a longitudinal series (28 to 35) will often help to solve the difficulty. Thus a male from Pentelikon, near Athens, which had been determined as *L. muralis*, var. *erhardi* by Prof. v. Méhély,

* This is perhaps a young *L. viridis*, similar to the *L. major*, var. *pseudo-ocellata* of Schreiber.

appeared to me from its proportions and coloration (bright orange below) to be referable to the typical form, and this view was confirmed by the number of ventrals and of gulars, viz. 24 and 24 respectively. This specimen, now in the British Museum, has been mentioned by Dr. R. Ebner in Verh. Zool.-bot. Ges. Wien., 1913, p. 310.

Habitat.—The var. *erhardi* appears to be restricted to the Grecian Archipelago (Northern Sporades and Cyclades), the above-mentioned reference to its occurrence near Athens being due to an erroneous identification.

Var. QUADRILINEATA.

Zootoca quadrilineata, Gray, Ann. N. H. i, 1838, p. 279.

Lacerta podarcis, var. *genei*, Cara, Mon. Lacert. Sard. p. 32 (1872).

Podarcis muralis, var. *lineata*, De Betta, Faun. d'Ital., Rett. Anf. p. 29 (1874), and Atti Ist. Ven. (5) iv, 1878, p. 901, and v, 1879, p. 389.

Podarcis tiliguerta, part., Camerano, Atti Acc. Tor. xiii, 1877, p. 87, pl. ii, fig. 1.

Lacerta muralis neapolitana, part., Bedriaga, Arch. f. Nat. 1879, p. 274.

Lacerta muralis fusca, Bedriaga, Arch. f. Nat. 1879, p. 268, and Abh. Senck. Ges. xiv, 1886, p. 191.

Lacerta muralis fusca, var. *corsica*, Bedriaga, Arch. f. Nat. 1883, p. 269, and op. cit. p. 193.

Lacerta taurica genei, Camerano, Mon. Saur. Ital. p. 49, pl. i, figs. 6–8, 22–25, 28 (1885).

Lacerta muralis genei, Camerano, Boll. Mus. Tor. i, 1886, No. 7.

Lacerta muralis neapolitana, var. *lineata*, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 229.

Lacerta muralis, var. *genei*, Méhely, Ann. Mus. Hung. ii, 1904, pp. 365 and 366.

Lacerta muralis, var. *quadrilineata*, Boulenq. Tr. Zool. Soc. xvii, 1905, p. 405, pl. xxiii, fig. 4, and pl. xxix, figs. 1–4; Schreib. Herp. Eur., ed. 2, p. 421 (1912); Boulenq. Tr. Zool. Soc. xx, 1913, p. 153.

Head rather small, about $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, moderately depressed, its depth equalling the distance between the anterior corner or the centre of the eye and the tympanum, its length $3\frac{2}{3}$ to $4\frac{1}{3}$ times in length to vent in males, 4 or 5 times in females; snout pointed. Neck as broad as or a little narrower than the head. Body moderately depressed. Hind limb reaching the collar or between the collar and the ear in males, the shoulder or the collar in females; foot $1\frac{1}{4}$ to $1\frac{1}{2}$

times as long as the head; toes rather long and slender, more compressed than in the typical form. Tail $1\frac{3}{4}$ to $2\frac{1}{5}$ times as long as head and body.

Rostral shield narrowly separated from the nostril or, frequently, entering it*; frontal as long as or shorter than its distance from the end of the snout; series of granules between the supraoculars and the superciliaries either complete or beginning behind the first superciliary†; parietals $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as broad, usually touching the upper postocular‡; occipital often as long as and broader than the interparietal; temporal scales small and granular; tympanic and masseteric shields always present; upper temporal shield small, often broken up into scales; normally four upper labials anterior to the subocular,§ which is much narrower beneath than above.

27 to 40 scales on a line between the symphysis of the chin-shields and the median collar-plate; gular fold distinct. Collar even-edged, with 9 to 13 plates.

Scales small, round, oval, or subhexagonal, very convex, smooth or feebly keeled, 56 to 77 across the middle of the body, usually 58 to 72; 40 (♂) to 57 (♀) transverse series, in the middle of the back, correspond to the length of the head, 3 and 4, 4, or 4 and 5 on the side correspond to a ventral plate. Ventral plates in 24 to 32 transverse series (24 to 28 in males, 26 to 32 in females).‖ Preanal plate rather small, usually bordered by two semicircles of small plates.

Scales on upper surface of tibia as large as or a little smaller than dorsals, keeled; 18 to 29 femoral pores on each side, usually 19 to 25; 27 to 34 lamellar scales under the fourth toe, usually 30 to 33.

Caudal scales truncate, upper rather strongly keeled, more or less oblique, the whorls subequal in length or longer and shorter alternately; 30 to 37 scales in the fourth whorl behind the postanal granules.

Brown, olive, or green above, usually spotted or marbled with blackish and with a yellowish or whitish dorso-lateral streak or series of spots; frequently a blackish vertebral streak or series of spots; sides, in

* In two specimens from Corsica and in two from Sardinia the rostral forms a narrow suture with the frontonasal.

† The series is complete in 20 specimens out of 45 from Corsica, in 22 out of 47 from Sardinia.

‡ Exceptions in 12 specimens from Corsica, in 1 from Sardinia.

§ 5 on both sides in 2 specimens from Corsica and in 4 from Sardinia, 5 on one side in 3 from Corsica and in 6 from Sardinia; 3 in 2 from Corsica and in 1 from Sardinia.

‖ In one specimen from Corte, Corsica, a few of the plates of the outer row are divided into two.

males, usually blackish, with numerous round light spots; females frequently uniform yellowish brown or mahogany-brown on the back, with a yellowish, black-edged dorso-lateral streak from the eye to the tail, and another, wider light streak from the ear to the groin; limbs with round, dark-edged, light spots. Lower parts white or yellow, without or with black spots, which are usually confined to the throat and the outer row of ventral plates, but which sometimes form a band along the second row of plates from the median line in females as well as in males. According to Lorenz Müller, the lower parts are sometimes bright orange in males.

Specimens in which the black markings preponderate on the upper parts, the light ground-colour appearing as four dorsal lines with small spots or cross-lines between them, have been named by Bedriaga var. *corsica*.

The following notes are taken from living specimens from Sardinia, for which I am indebted to Count Peracca:

Coppery brown, yellowish brown, greenish yellow, or bright green above; white, with mother-of-pearl sheen, or greenish yellow beneath; turquoise-blue spots always present above the shoulder and on the outer ventral plates; some specimens with numerous blue spots on the sides, alternating with others of a green or greenish yellow shade; the dorso-lateral streak pale brownish or greenish yellow.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
Corsica:							
♂ Orezza (type of var. *corsica*)	60	60	24	9	29	21	32
„ Corte	59	58	26	10	28	23	34
„ „	57	65	26	11	30	25–26	30
„ „	50	60	26	10	28	23–22	29
♀ „	55	56	26	9	31	20–21	30
„ „	51	57	29	?	29	24–22	29
„ „	50	63	26	9	34	23–24	30
♂ Ajaccio	56	75	25	11	32	23–25	28
„ „	56	72	24	11	30	22	?
„ „	55	69	26	13	28	21–22	31
♀ „	55	70	29	10	33	19	33
„ „	55	72	28	10	34	25	34
Sardinia:							
♂ Latzorbé	64	66	27	9	28	22–21	30
„ „	63	77	28	10	40	23–24	31
„ „	62	66	25	9	35	24–25	28

	1.	2.	3.	4.	5.	6.	7.
♂ Latzorbé	61	68	26	9	32	23	30
,, ,, ...	58	64	24	9	28	22	30
♀ ,, ...	60	64	27	9	34	22–33	32
,, ,, ...	58	60	26	9	27	21–20	33
,, ,, ...	57	58	29	10	40	24–25	31
,, ,, ...	52	71	27	11	33	28–29	30
,, ,, ...	51	61	29	11	31	21–23	31
♂ Flumini di Quarto . .	69	63	27	10	28	23–22	34
,, ,, ,, . .	63	71	25	11	30	22	31
,, ,, ,, . .	60	64	26	9	35	24–23	33
,, ,, ,, . .	60	60	26	9	27	22–23	31
,, ,, ,, . .	58	72	26	9	29	24–25	31
♀ ,, ,, . .	59	60	32	10	27	22	28
,, ,, ,, . .	55	67	29	11	29	19–18	29
♂ Lanusei	63	66	27	10	39	25–24	34
,, ,, ...	61	70	25	11	40	27–28	31
,, ,, ...	51	70	27	11	32	26	27
,, ,, ...	48	75	25	14	36	23–22	31
♀ ,, ...	57	66	29	11	31	22–23	33
,, ,, ...	48	72	27	11	32	25	31
♂ Cagliari	64	65	25	11	33	25–24	28
,, ,, ...	58	63	25	11	32	23	31
,, ,, ...	52	72	27	9	34	24–26	32
♀ ,, ...	57	61	27	11	29	21	32
♂ Carloforte, S. Pietro Id. .	64	73	25	11	30	26–25	32
,, ,, ,, .	60	60	26	11	33	21	31
,, ,, ,, .	57	64	26	11	33	23	33
,, ,, ,, .	54	61	23	11	34	23–25	30
♀ ,, ,, .	51	71	27	10	32	22	28
,, Sardinia (type) . .	60	67	28	11	30	26–24	30
,, ,, (,,) . .	51	60	26	11	32	21–22	30
,, ,, (,,) . .	47	64	27	11	29	20	31
TUNISIA:							
♂ Tunis, **T.M.**	60	63	27	11	31	22–23	31

Columns as on p. 175.

Habitat.—This variety is common in Corsica and Sardinia, from sea-level to about 1100 metres altitude. Its occurrence in Tunisia has been reported by Camerano, on the evidence of a single specimen, stated to have been obtained in the vicinity of Tunis by the late Marquis O. Antinori in 1865, along with one of the var. *tiliguerta*.

Var. FILFOLENSIS.

Zootoca lilfordi, part., Günth. Ann. & Mag. N.H. (4), xiv, 1874, p. 158.

Lacerta filfolensis, Bedriaga, Die Faraglione-Eidechse, p. 19 (1876); Braun, Arb. Zool. Inst. Würzb. iv, 1877, p. 49, pl. i, fig. 14; Bedriaga, Arch. f. Nat. 1878, p. 297.

Lacerta muralis, part., Eimer, Arch. f. Nat. 1881, p. 370; Camerano, Mon. Saur. Ital. p. 30 (1885); Schreib. Herp. Eur., ed. 2, p. 410 (1912).

Lacerta muralis, var. *filfolensis*, Eimer, Arch. f. Nat. 1881, p. 408, pl. xv, fig. 24; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 234; Bouleng. Cat. Liz. iii, p. 32 (1887), and Tr. Zool. Soc. xvii, 1905, p. 401, pl. xxvii, fig. 9, and pl. xxviii, fig. 5; Schreib. op. cit. p. 419; Bouleng. Tr. Zool. Soc. xx, 1913, p. 156, pl. xvii, figs. 6–8.

Podarcis muralis, var. *filfolensis*, De Betta, Atti Ist. Ven. (3), v, 1879, p. 392.

Lacerta muralis, *neapolitana*, part., Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 220.

Lacerta muralis, var. *serpa*, part., Bouleng. Tr. Zool. Soc. xvii, 1905, p. 399, pl. xxvii, fig. 8.

Lacerta muralis, var. *chrysochlora*, Schreib. op. cit. p. 420.

With an insufficient material before me, I first referred the lizards from Malta and Linosa to *L. serpa* (= *albiventris*), and maintained the var. *filfolensis* for the larger form from the Filfola Rock, near Malta. The characters for separating the latter now break down, but the Maltese and Linosa specimens are sufficiently distinguished by their coloration and their average smaller scaling to be separated from the former. I therefore retain the name *filfolensis*, but apply it to the lizards from the main island and from Linosa and Lampione, as well as to those for which it was originally intended. Much as I regret using so unsuitable a name, in view of the extended range of the variety, I am compelled to do so in preference to the alternative of proposing a new name. I should see no objection to these lizards being united with the var. *quadrilineata* from Corsica and Sardinia, from which some specimens are, to my eye, undistinguishable. The only characters which can be adduced in favour of their separation is that in the var. *quadrilineata* there are usually fewer than 70 scales across the body (56 to 77 being the ascertained range of variation), and the rostral usually touches or enters the nostril, and in the var. *filfolensis* there are usually more scales and the rostral rarely touches the nostril.*

* In about 10 per cent. of the specimens examined.

Further, I am not prepared to say that I could, in all cases, tell a Maltese lizard from certain specimens of the var. *albiventris* from Italy. I may repeat it again: most of these forms are undefinable by the characters to which we have to resort, however greatly they seem to differ when only their extremes are compared; and that is why, until they can be properly diagnosed, I refrain from allowing them the rank of species. In its very fine lepidosis this variety shows special affinity to the Balearic var. *lilfordi*.

Head $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, moderately depressed, its depth equalling the distance between the anterior cornea or the centre of the eye and the tympanum, its length $3\frac{1}{2}$ to $4\frac{1}{3}$ times in length to vent in males, $3\frac{3}{4}$ to $3\frac{1}{4}$ times in females. Neck as broad as or a little broader than the head. Body moderately or strongly depressed. Hind limb reaching the shoulder, the collar, or between the collar and the ear in males, the elbow, the axil, or the shoulder in females; foot $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as the head. Tail $1\frac{2}{3}$ to a little over 2 times as long as head and body, often very thick, or even swollen in its anterior third.

Rostral very rarely touching the nostril*; frontal as long as or considerably shorter than its distance from the end of the snout; series of granules between the supraoculars and the superciliaries usually incomplete,† the first superciliary, rarely also the second, in contact with the second supraocular; parietals $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, usually in contact with the upper postocular‡; occipital very variable in size, as long as or shorter than the interparietal, and sometimes broader§; upper temporals narrow or broken up; temporal scales usually small, granular, masseteric shield usually well developed; four upper labials anterior to the subocular,‖ which is much narrower beneath than above.

27 to 38 scales (in one specimen 21) on a line between the symphysis of the chin-shields and the median collar-plate; gular fold distinct. Collar even-edged, composed of 9 to 12 (rarely 8) plates, which are often very small.

Scales granular-subhexagonal, feebly or faintly keeled, 61 to 85 across the middle of the body, usually 64 to 80; 40 (♂) to 62 (♀) transverse series in the middle of the back correspond to the length of the head, 3 and 4, or 4 and 5, on the side, correspond to a ventral

* In contact with the frontonasal in 2 specimens from Malta.

† Complete in 3 specimens from Malta, in 5 from Filfola; usually complete in specimens from Linosa.

‡ Exceptions in 6 specimens from Malta, in 6 from Filfola, in 3 from Linosa.

§ Twice as broad in a specimen from Malta, three times in another.

‖ Five on one side in a male and on both sides in a young specimen from Malta.

plate. Ventral plates in 24 to 31 transverse series (24 to 30 in males, 28 to 31 in females).* Preanal rather large, bordered by one or two semicircles of small plates.

Scales on upper surface of tibia smaller than dorsals; 18 to 27 femoral pores on each side, usually 20 to 25†; 30 to 36 lamellar scales under the fourth toe, in one specimen 27.

Caudal scales truncate or very obtusely pointed, more or less strongly, rarely feebly, keeled, more or less oblique, the whorls subequal or longer and shorter alternately; 34 to 42 scales in the fourth whorl behind the postanal granules.

Coloration extremely variable in the specimens from the main island of Malta. Males greyish olive with a darker lateral band, or with the sides speckled with blackish, with or without a vertebral series of small blackish spots, or reticulate all over with brown or black, the network enclosing roundish yellow or green spots; on the posterior part of the back the dark markings may form wavy transverse bars. Some females with a whitish, black-edged dorso-lateral streak, others uniform olive-grey without markings. The head is sometimes uniform olive-brown above and on the sides, sometimes much spotted with black.‡ The lower parts are white, yellow, orange, or red, unspotted or with black spots which may form regular longitudinal series along the rows of ventral plates, and the throat is often marbled with black; outer ventral shields with blue spots, or entirely blue. Black and white spots sometimes form annuli on the tail. The young is covered with dark and light spots, with a dark lateral band edged above and below with whitish.

The lizard from Linosa, of which I have seen living specimens, is on the whole intermediate between that from Malta and that from the Filfola Rock. In one of the male specimens the top of the head and a broad median dorsal stripe are of a slightly reddish brown, the sides are black with round, greenish yellow spots; outer row of ventral shields black and blue; belly pale pink with a longitudinal series of large black spots on the second row of shields; chin and throat yellowish white with large spots or marblings. In another male a black network extends over the whole back, whilst in further individuals of the same sex the upper parts are black with small light

* There is less difference between the sexes in this respect than in the typical form and most of the varieties of *L. muralis*, with the exception of the vars. *lilfordi*, *bedriagæ* and *sardoa*.

† A male from Malta has a row of "pseudopores" in addition, as is frequent in the var. *sardoa*.

‡ These markings may recall those of the typical form or of the vars. *brueggemanni*, *tiliguerta* or *trilineata*, sometimes in a very striking manner.

spots, exactly as in the lizard from Filfola. The larger female is dark brown above, with a black network enclosing small yellowish spots, and with traces of three black longitudinal stripes, the median very narrow; belly pinkish, the sides spotted with black; small blue spots on the outer row of ventral shields. The smaller female also dark brown above, with a narrow black vertebral streak and a black lateral band edged with whitish above and below; lower parts as in the preceding.

The true *Lacerta filfolensis*, from the Filfola Rock near Malta, which I have also seen alive, is remarkable for its larger size and dark coloration. Upper parts usually black, with pale green dots or small round or oval spots, which are usually larger on the sides, sometimes dull olive-brown with black spots and a broad black vertebral stripe; head black or dark brown above, uniform or with small light spots. Belly black and blue on the sides, copper-colour, orange or black in the middle in males, pink, dull yellow, or black in females; in some specimens large black spots form regular longitudinal bands on the ventral plates. Tail sometimes with light spots above and beneath. A female specimen is entirely black above. The Filfola lizard has often been compared or even associated with other melanic forms peculiar to islets or detached rocks on the west coast of Italy, in the Balearic Islands and in the Adriatic. It must be borne in mind that the resemblance is entirely superficial, the melanism being here due not to a darkening of the ground colour but to the extension of the black markings, another example of which is offered by the var. *nigriventris*, which inhabits the mainland of Italy, thus showing, as in the case of *L. oxycephala*, that melanic races may be developed and fixed quite apart from isolation on small islands. That the colour is influenced by environment is an explanation that will certainly be rejected by those who, like myself, have seen the green lizards of the var. *albiventris* running on the old walls of Rome side by side with the black var. *nigriventris*.

As a series of measurements shows, there is no difference in the proportions between the Maltese lizard and that from Filfola. I am at a loss to understand how Eimer* can have described the former as "platycephalous" as opposed to the latter, which he regarded as "pyramidocephalous."

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Malta	71	61	27	11	35	25	34
„ „	65	62	25	11	21	20–18	27

* Arch. f. Nat. 1881, p. 370.

	1.	2.	3.	4.	5.	6.	7.
♂ Malta	63	64	25	9	30	23-24	30
,, ,,	62	66	27	10	28	22-23	31
,, ,,	62	73	27	12	29	24-25	31
,, ,,	62	72	27	10	36	24-22	32
,, ,,	60	64	26	10	30	20-22	30
,, ,,	60	75	24	11	34	25-23	33
,, ,,	59	74	27	9	31	20-22	33
,, ,,	59	80	27	10	31	24-26	34
,, ,,	57	70	27	11	32	21-19	32
,, ,,	56	66	28	9	30	23	35
♀ ,,	57	68	29	9	31	20-22	33
,, ,,	57	64	30	11	29	24-22	32
,, ,,	53	75	29	10	28	19-20	30
♂ Biretzbriga, Malta	57	68	27	12	30	22-23	32
,, ,, ,,	52	70	28	9	34	27-26	35
,, Rock in St. Paul's Bay	59	85	27	9	33	24-23	36
,, ,, ,, ,,	55	78	27	10	33	24-23	36
,, ,, ,, ,,	55	70	26	10	33	21-22	35
,, ,, ,, ,,	55	71	27	9	34	23-24	33
♀ ,, ,, ,,	50	84	30	11	35	24-25	36
,, ,, ,, ,,	48	70	29	10	34	20-21	35
♂ Filfola Rock	84	80	26	10	31	24	34
,, ,, ,,	82	78	26	10	29	18-20	33
,, ,, ,,	82	75	28	12	36	23	?
,, ,, ,,	80	75	26	10	33	23	?
,, ,, ,,	80	77	27	10	37	25-26	?
,, ,, ,,	79	76	28	11	36	23	34
,, ,, ,,	78	77	28	11	36	24-25	35
,, ,, ,,	78	79	27	11	34	23-24	?
,, ,, ,,	78	78	28	11	37	23-25	30
,, ,, ,,	76	80	26	9	38	27	32
,, ,, ,,	76	70	28	11	34	25-24	32
,, ,, ,,	75	82	27	11	36	24	34
,, ,, ,,	75	80	29	10	32	23-25	35
,, ,, ,,	75	80	28	10	33	25	33
,, ,, ,,	74	74	27	10	35	26-25	36
,, ,, ,,	74	77	27	12	36	24-26	31
,, ,, ,,	73	75	28	12	37	22-24	34
,, ,, ,,	72	82	30	10	32	28-26	36
,, ,, ,,	72	79	28	10	33	23-24	35
,, ,, ,,	67	71	26	10	35	24	31

	1.	2.	3.	4.	5.	6.	7.
♂ Filfola Rock	65	74	28	11	34	22	31
♀ „ „	74	69	31	10	33	24	35
„ „ „	70	75	29	10	32	22	31
„ „ „	69	72	29	10	31	24	32
„ „ „	67	78	30	10	35	22–24	35
„ „ „	65	77	29	10	36	20–21	32
„ „ „	64	73	30	9	34	24	31
„ „ „	63	68	28	11	37	25	36
„ „ „	62	74	29	11	38	24	36
„ „ „	62	73	28	11	30	25	31
„ „ „	57	70	30	9	34	22–23	?
„ „ „	56	79	28	11	33	21–23	32
„ „ „	56	77	28	8	32	22	33
♂ Linosa	70	71	27	10	36	25–26	35
„ „	65	75	26	12	33	26–27	34
„ „	65	67	27	10	29	21–22	33
„ „	65	70	27	9	36	25–24	35
„ „	63	72	26	9	33	23–24	33
„ „	62	69	25	11	28	21–23	35
♀ „	61	73	28	10	30	24–23	31
„ „	59	65	28	9	31	21–22	32
„ „	58	68	28	9	28	23	34
„ „	54	73	29	11	30	22	31
„ „	49	69	28	9	28	22–21	31
♂ Lampione	86	72	27	10	33	27–25	31
„ „	67	74	27	12	28	23–22	30
„ „	67	70	26	11	31	24–25	31
„ „	67	70	29	10	31	25–26	33
„ „	65	75	27	9	30	24–23	?
„ „	63	71	26	11	27	23	34
♀ „	61	68	29	11	27	25	32
„ „	60	67	29	9	33	23	29

Columns as on p. 175.

M. de Southoff, in pointing out to me that lizards identical with those from Linosa occur on Lampione Islet, south of Lampedusa, adds that no *Lacerta* exists on Lampedusa itself, only Geckos and *Chalcides*. The late Prof. Giglioli suggested the abundance of the lizard-eating snake *Macroprotodon cucullatus* on Lampedusa as accounting for the absence of *Lacerta muralis* on that island.

Var. LILFORDI.

Zootoca lilfordi, part., Günth. Ann. & Mag. N. H. (4) xiv, 1874, p. 158.

Lacerta lilfordi, Braun, Arb. Zool. Inst. Würzb. iv, 1877, p. 4.

Lacerta muralis, Braun, t.c. p. 26.

Lacerta muralis fusca, part., Bedriaga, Arch. f. Nat. 1878, p. 275.

Lacerta muralis, var. *gigliolii*, Bedriaga, op. cit. 1879, p. 247, pl. xvii, fig. 2.

Lacerta muralis, vars. *balearica, gigliolii, lilfordi*, Bedriaga, Bull. Soc. Zool. France, 1879, p. 221, pl. ix, figs. 1–3.

Lacerta muralis balearica, part., Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 248.

Lacerta muralis, var. *lilfordi*, Bouleng. Tr. Zool. Soc. xvii, 1885, p. 372, pl. xviii, fig. 1, and pl. xxvi, figs. 6, 7.

Lacerta lilfordi, part., Schreib. Herp. Eur., ed. 2, p. 464 (1912).

Head $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, moderately depressed, its depth equalling the distance between the anterior corner or the centre of the eye and the tympanum; snout usually decidedly pointed; cheeks rather swollen in males. Neck as broad as or broader than the head. Body moderately depressed. Hind limb reaching the shoulder, the collar, or a little beyond the latter in males, the axil or the shoulder in females; foot 1 to $1\frac{1}{3}$ times the length of the head. Tail $1\frac{1}{2}$ to $1\frac{4}{5}$ times the length of head and body, often of equal thickness in its anterior third.

Rostral narrowly separated from the nostril, sometimes entering it; frontal as long as or shorter than its distance from the end of the snout; series of granules between the supraoculars and the superciliaries complete or incomplete, the first superciliary often in contact with the second supraocular; suture between the first and second superciliaries usually oblique, sometimes vertical; parietal $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, in contact with the upper postocular; occipital very variable in size, often longer and broader than the interparietal.* Subocular narrower beneath than above; upper temporal shields entirely absent or broken up into a series of small shields; temple covered with granular scales; masseteric shield usually distinct.†

30 to 41 scales on a line between the symphysis of the chin-shields

* Twice as long and twice as broad in a male from Mahon.—Totally absent in a female from the same island.

† Very small or hardly distinct in single specimens from Mahon, Dragoneras Island, Ayre Island, and Colomer Island.

and the median collar-plate ; gular fold distinct. Collar even-edged, formed usually of small or very small plates, 9 to 15 in number.

Scales granular, round or oval, smooth, 70 to 90 across the middle of the body ; 42 to 62 transverse series, in the middle of the back, correspond to the length of the head, 4 and 5 (rarely 3 and 4) on the side correspond to a ventral plate. Ventral plates in 26 to 30 transverse series in males, 27 to 31 in females.* Preanal plate moderate or rather large, sometimes small, bordered by one or two series of small plates.

Scales on upper surface of tibia finely granular, smooth, smaller than dorsals. 17 to 25 femoral pores on each side, usually 19 to 24. 27 to 32 lamellar scales under the fourth toe.

Upper caudal scales not, or but slightly, oblique, more or less strongly keeled, truncate or very obtusely pointed behind ; the whorls subequal in length, the fourth behind the postanal granules containing 30 to 46 scales.

The colour of the back varies from brown to olive, bright grass-green, or blue-green†; the sides are brown or reddish brown with paler brown or pale green spots. Three stripes of dark brown or blackish spots or vermiculations extend along the back, but it frequently happens that these stripes lighten in the centre and that their borders become converted into lines, such specimens having six fine dark lines along the back ; others may have dark marblings or vermiculations all over the back, and such is the case in the single very young specimen (from Mahon) I have examined ; upper surface of head and tail with small blackish spots. The lower parts vary from orange to salmon-red, copper-colour, or brick-red, without or with small black spots which may form regular longitudinal series ; a series of turquoise-blue spots on each side of the belly ; throat spotted or marbled with reddish brown or blackish.

In the specimens from Dragoneras Island, Minorca, named var. *gigliolii* by Bedriaga, the back, at least posteriorly, and the upper surface of the tail are described as of a dark blue-green or peacock-blue, the outer row of ventral shields lapis-blue. Preserved in spirit as they are now, the type specimens cannot be distinguished from ordinary Minorca lizards.

The Ayre Island specimens were described by Günther (*Zootoca lilfordi*) as uniform deep shiny black above and of a beautiful sapphire-

* A similar lack of sexual differentiation occurs in the vars. *bedriagæ* and *filfolensis*.

† Green specimens which I kept alive became brown after a time, thus showing the colour to be seasonal in some cases.

blue beneath. But some specimens from the same island sent to me alive by Sr. Ferrer are only of a very dark brown, with the dark markings (lines and spots) of the Minorca form perfectly distinguishable; pale bluish green or turquoise-blue spots on the sides of the lapis-blue belly, which may bear small black spots. Now that they have been in spirits for many years, Lord Lilford's specimens also show very distinctly the dorsal markings. Some of the black specimens from La Guardia Island, Colomer Island, and Cabrera Island, all near Majorca, have numerous pale bluish green spots on the sides of the body and on the limbs. The young of these melanistic insulars are described by Braun as brown above, with dark spots and lines, dark brown or black on the sides, with numerous blue spots, tail dark green; the belly is greenish in the middle, black spotted with blue on the sides.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Mahon	70	78	27	15	37	24–25	29
„ „	66	90	28	11	35	25–22	27
♀ „	61	70	29	10	30	23	32
„ „	60	82	27	11	37	22	30
♂ Minorca (type of var. *balearica*)	62	80	26	10	36	21	29
„ I. del Rey	67	79	28	11	35	20	28
„ „	64	85	27	11	35	21–24	28
„ „	64	83	30	9	37	24–23	30
„ I. del Ayre	77	87	27	12	33	20–21	30
„ „	75	83	26	11	38	21–23	27
„ „	72	78	28	10	39	23	30
„ „ (type)	64	90	27	11	36	23–22	30
„ „ („)	64	83	27	10	31	20	29
♀ „	72	82	28	12	35	20–18	28
„ „	64	80	30	10	35	20	27
„ „ (type)	61	80	27	10	38	20–19	27
„ „ („)	53	88	27	13	40	21	29
♂ I. Dragoneras (type of var. *gigliolii*)	64	77	27	13	37	24–23	29
„ „ „	56	75	29	10	32	24	27
„ I. La Guardia, nr. Majorca	62	76	28	14	32	18–19	29
„ „ „	62	85	26	12	35	19	29
„ „ „	60	86	26	15	36	22–21	28
„ „ „	56	70	28	11	30	17	29
„ „ „	52	72	27	15	32	19–20	29

	1.	2.	3.	4.	5.	6.	7.
♂ I. La Guardia, nr. Majorca .	51	79	28	14	34	18–17	28
„ I. Colomer, „ .	76	72	28	9	34	22–23	32
„ „ „ .	76	81	28	11	41	23–22	31
„ „ „ .	73	83	27	11	38	22–20	29
„ I. Cabrera, „ .	57	73	27	12	34	22	29
♀ „ „ .	63	72	31	(?)	32	24	27
„ „ „ .	54	76	29	12	32	21–22	27

Columns as on p. 175.

Habitat.—Balearic Islands: Minorca, Majorca, and neighbouring islets. The specimens from I. del Ayre, La Guardia, Las Frares, Colomer and Cabrera are black and represent the var. *lilfordi*, s. str.

Var. PITYUSENSIS.

Lacerta muralis balearica, Boscá, An. Soc. Espan. H. N. xii, 1883, p. 245.

Lacerta muralis, var. *pityusensis*, Boscá, l.c. p. 246; Bouleng. Tr. Zool. Soc. xvii, 1905, p. 370, pl. xxvi, figs. 1–5.

Lacerta muralis balearica, var. *pityusensis*, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 254.

Lacerta lilfordi, part., Schreib. Herp. Eur., ed. 2, p. 464 (1912).

Head 1½ to 1⅔ times as long as broad, moderately depressed, as in the preceding; snout rather pointed. Body and limbs as in the preceding. Tail 1½ to a little over 2 times as long as head and body.

Rostral entering the nostril, often largely; exceptionally two postnasals*; frontal as long as or shorter than its distance from the end of the snout; series of granules between the supraoculars and the superciliaries usually incomplete†; occipital usually as long as and broader than the interparietal, sometimes much smaller; parietals as in the preceding; only exceptionally five anterior upper labials‡; temporal scales very small, usually with a large masseteric disc, which is but rarely entirely absent. 26 to 36 scales between the symphysis of the chin-shields and the median collar-fold; gular fold distinct. Collar even-edged, formed of usually rather small plates, 9 to 14 in number.

* On one side in three specimens in the British Museum, on both sides in one in the Madrid Museum.

† Reduced to a few in five specimens.

‡ On one side in two specimens, on both sides in two others.

Scales granular, roundish-hexagonal, more or less feebly keeled, sometimes very faintly, 55 to 68 across the middle of the body; 35 to 47 transverse series on the back correspond to the length of the head, 3 and 4 (rarely 4 throughout) to a ventral plate. Ventral plates in 25 to 28 transverse series in males, 27 to 30 in females. Preanal plate moderately large or rather small, bordered by one or two semicircles of small plates.

Scales on upper surface of tibia finely granular, much smaller than dorsals, more or less distinctly keeled. 18 to 24 femoral pores on each side. 26 to 31 lamellar scales under the fourth toe.

Upper caudal scales not or but slightly oblique, strongly keeled, truncate or very obtusely pointed behind; the whorls subequal in length, the fourth containing 30 to 38 scales.

Brown, yellow, or green above, with black or reddish-brown spots or vermiculations, usually arranged in 5 or 7 more or less well-defined longitudinal stripes, or with dark spots and vermiculations accompanied by a narrow black vertebral streak, the dark markings sometimes forming chains enclosing roundish light spots, much as in the type specimen of the var. *hispanica* figured by Steindachner, or an irregular reticulate pattern, or reduced to mere dots or vermiculations. Females often with a light dorsolateral streak, beginning from the superciliary edge, sometimes bordered by fine black lines, sometimes with a black vertebral streak. Upper surface of head spotted or vermiculated with black; tail with dark and light markings, forming more or less regular longitudinal series. Young with 6 light streaks on the body. Belly yellow, orange, or red, without markings, except on the outer row of ventral plates, which bear large blue spots and occasionally small black ones in addition.

The above description is taken from 79 specimens, all collected by Sr. Boscá, and from 9 received from M. G. de Southoff.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Iviza (type)	80	60	26	12	30	21	?
,, ,, ,, ...	75	61	27	10	31	23–21	28
,, ,, ,, ...	73	67	27	14	34	24–22	28
,, ,, ,, ...	72	62	28	9	30	22–24	28
,, ,, ,, ...	72	60	27	12	28	22–23	?
,, ,, ,, ...	70	63	26	12	26	20	27
,, ,, ,, ...	67	60	26	12	28	19–20	26
,, ,, ,, ...	65	63	27	11	31	21	27
,, ,, ,, . . .	64	62	28	10	32	23	26

	1.	2.	3.	4.	5.	6.	7.
♂ Iviza (type)	62	68	27	11	32	23	30
,, ,, ,,	60	64	27	11	29	23–24	27
♀ ,, ,,	70	60	30	9	26	19	27
,, ,, ,,	64	55	29	9	29	20–21	27
,, ,, ,,	62	57	28	11	33	22–21	31
,, ,, ,,	58	57	29	10	33	20–21	26
,, ,, ,,	55	56	28	10	31	23–22	28
♂ ,,	75	55	26	11	29	18	26
,, ,,	74	55	25	11	29	22–23	27
,, ,,	72	61	27	10	34	24	27
,, ,,	72	60	26	11	30	21	28
,, ,,	70	61	26	11	31	23	28
,, ,,	66	60	26	11	33	21–22	26
,, ,,	60	61	27	12	36	22–21	28
♀ ,,	58	56	27	12	32	23	?

Columns as on p. 175.

This variety was discovered by Boscá on Iviza and on the neighbouring small islets La Grosa, La Redonia, and El Malvi. It is quite distinct from the var. *lilfordi*, and in some respects approaches the var. *quadrilineata*, whilst the var. *lilfordi* is perhaps more closely related to the var. *filfolensis*.

Measurements (in millimetres): Varieties, Group II.

	1. ♂	2. ♀	3. ♂	4. ♂	5. ♀	6. ♀	7. ♂	8. ♀	9. ♂	10. ♂	11. ♀	12. ♂	13. ♀	14. ♂	15. ♀	16. ♂	17. ♀	18. ♂	19. ♀
From end of snout to vent	71	60	69	57	55	60	69	59	60	71	57	82	70	70	61	64	61	72	64
From end of snout to fore limb	28	23	26	22	20	22	27	22	24	28	21	30	25	28	21	28	23	30	23
Length of head	19	14	17	16	13	14	16	13	15	17	12	20	15	16	13	17	15	18	15
Width of head	12	9	11	10	8	9	11	8	10	11	7·5	13	10	11	9	12	9	13	9
Depth of head	10	7	9	8	6·5	7	8	7	8	9	6	10	7	9	7	9	7	11	7
Fore limb	23	20	23	19	17	20	24	20	21	24	20	29	22	23	18	25	23	28	19
Hind limb	39	30	36	32	27	35	40	35	36	43	30	46	38	40	31	37	35	40	32
Foot	21	17	19	18	15	19	22	18	20	24	18	24	20	21	18	19	18	21	17
Tail	—	—	122	115	—	118	130	—	—	—	—	135	125	—	—	110	—	115	—

Var. *erhardi*. 1, 2. Mikonos. 3. Naxos (type of var. *naxensis*). 4. Milos (type of var. *milensis*). 5. Erimomilo (type of var. *nigrogularis*).

Var. *quadrilineata*. 6. Sardinia (type). 7, 8. Flumini di Quarto. 9. Orezza (type of var. *corsica*).

Var. *filfolensis*. 10, 11. Malta. 12, 13. Filfola. 14, 15. Linosa.

Var. *lilfordi*. 16, 17. Ayre Island (types).

Var. *pityusensis*. 18, 19. Iviza (types).

Group III.—Italy, Tuscan Archipelago, Corsica, Sardinia, Sicily, Tunisia, and Minorca.

This group includes the vars. *bedriagæ* and *sardoa*, in which the head and body are very strongly depressed (although not more so than in certain forms of Groups IV and V), and a few others which fill up the gap between them and the typical *L. muralis*. Although the extremes are so different, I feel sure this is a natural association, and that the resemblance which the var. *bedriagæ* bears to *L. oxycephala* is merely a case of convergence.

Although the shape of the head varies individually in the vars. *nigriventris*, *insulanica*, and *tiliguerta*, these lizards as a whole answer to the *platycephali* of Eimer, and whilst the more primitive pattern of coloration in the vars. *brueggemanni* and *tiliguerta* pertains to the *maculata-striata* type of the same author, the great majority of them fall under his *reticulata* and *tigris* types, which are the exception in the first group.

The var. *brueggemanni* is so completely linked with the typical form in the north of its habitat as to render the distinction arbitrary in some cases, and farther south it is hardly to be separated from the vars. *nigriventris* and *insulanica*. Although strikingly different in their extremes, these varieties are not susceptible of satisfactory definitions.

Var. *brueggemanni*, Bedr.—Scales feebly but distinctly keeled, 51 to 65 across the body; 17 to 25 femoral pores; 23 to 29 lamellar scales under the fourth toe; colour usually green above; belly usually with large black spots.—Italy and Elba.

Var. *nigriventris*, Bp.—Scales distinctly keeled, 56 to 73 across the body; 16 to 25 femoral pores; 24 to 31 lamellar scales under the fourth toe; black predominating above and beneath.—Rome, Naples.

Var. *insulanica*, Bedr.—Scales feebly but distinctly keeled, 60 to 74 across the body; 18 to 26 femoral pores; 26 to 33 lamellar scales under the fourth toe; belly spotted with black at least on the sides, the black sometimes predominating above and beneath.—Pianosa near Elba.

Var. *tiliguerta*, Gm.—Scales feebly but distinctly keeled, 60 to 82 across the body; 20 to 28 femoral pores; 28 to 37 lamellar scales under the fourth toe; anterior upper temporal shield often in contact with fourth supraocular; belly without black spots.—Islands of the Gulf of Tuscany, Sardinia, Sicily, Pantellaria, Tunis, Minorca.

Var. *bedriagæ*, Camer.—Scales smooth, 58 to 84 across the body; 19

to 29 femoral pores; 26 to 31 lamellar scales under the fourth toe; head and body very strongly depressed; often 5 upper labials anterior to the subocular; anterior upper temporal shield often in contact with the fourth supraocular.—Mountains of Corsica.

Var. *sardoa*, Peracca.—Scales smooth, 64 to 82 across the body; 21 to 31 femoral pores; 26 to 31 lamellar scales under the fourth toe; head generally narrower than in the preceding; rostral nearly always in contact with the frontonasal.—Mountains of Sardinia.

The last two varieties are, in my opinion, to be regarded as parallel adaptations to life at great altitudes. The former may have been connected by intermediate forms, now extinct, with the var. *insulanica*, and the latter with the var. *tiliguerta*, or both may have been derived from the var. *tiliguerta*, which, though now absent from Corsica, perhaps existed in the past on all the Tyrrhenian Islands.*

Var. BRUEGGEMANNI.

Lacerta muralis, var. *nigriventris*, Eimer, Zool. Stud. Capri, ii, p. 30 (1874).

Lacerta muralis, var. *brueggemanni*, Bedriaga, Arch. f. Nat. 1879, p. 304, pl. xvii, fig. 1, Bull. Soc. Zool. France, 1879, p. 219, and Abh. Senck. Ges. xiv, 1886, p. 247; Bouleng. Cat. Liz. iii, p. 30 (1887), Tr. Zool. Soc. xvii, 1905, p. 380, pl. xxii, figs. 1–3, and xx, 1913, p. 148, pl. xvii, figs. 1–5.

Lacerta muralis reticulata nigriventris, Eimer, Arch. f. Nat. 1881, p. 355.

Lacerta muralis, var. *nigriventris*, part., Schreib. Herp. Eur., ed. 2, p. 411 (1912).

This variety is completely connected with the typical form, and the proportions do not differ, nor does, as a rule, the shape of the head, although it may be very strongly depressed—its depth, in certain males from Liguria, not exceeding the distance between the eye and the tympanum.† The hind limb reaches the shoulder or the collar in males, the axil in females.

The rostral does not touch the nostril,‡ and is sometimes in contact with the frontonasal, forming a suture§; the frontal is often shorter

* Cf. Boulenger, C. R. Ac. Sci. Paris, clxiv, 1917, p. 803.

† Such specimens (from Genoa) may have the body much flattened, twice as broad as deep.

‡ Enters the nostril in a male from Tuscany.

§ In single specimens from Sestra Ponente, Portofino, Livorno, Bellagio, and Lerici.

than its distance from the end of the snout; 5 to 7 superciliaries, usually 6, the suture between the first and second usually oblique; the granules between the supraoculars and the superciliaries may form a complete series, or be reduced to from 2 to 5*; the anterior upper labials are usually 4 in number†; the subocular is usually narrower beneath than above; the masseteric shield is well developed, or even large, except in the type specimen, which is further aberrant in having the parietal shields transversely divided; exceptionally the temporals are rather large, as usual in the var. *campestris*.‡

19 to 30 scales between the symphysis of the chin-shield and the median collar-plate; gular fold distinct. Collar even-edged, composed of 8 to 12 plates, usually 9 to 11.

Scales granular and feebly but distinctly keeled, 51 to 65 across the middle of the body, usually 53 to 62; 35 (♀) to 52 (♂) transverse series, in the middle of the back, correspond to the length of the head, 4, or 3 and 4, to a ventral plate. 22 to 26 transverse series of ventral plates in males, 26 to 30 in females. Preanal plate large, bordered by a single semicircle of small plates, rarely by two.

Scales on upper surface of tibia smaller than dorsals. 17 to 25 femoral pores on each side, usually 18 to 23. 23 to 29 lamellar scales under the fourth toe, usually 24 to 27.

Scales on the upper surface of the tail rather strongly keeled, more or less oblique, truncate or posterior border forming a very obtuse angle; the whorls more or less unequal in length, sometimes very markedly longer and shorter alternately, 30 to 36 scales in the fourth or fifth.

The type specimens, from Spezia, are described by Bedriaga as yellowish green or pale green in the males, with fine wavy black cross-streaks forming a network on the sides, which encloses many pale blue spots, the meshes on the shoulder considerably larger and representing the ocellus of the var. *albiventris*; upper surface of head brown, spotted with green; limbs grey or green above, with pale green ocelli; upper surface of tail greenish-brown, with dark brown zigzag markings. Belly whitish, spotted with black, one spot to each shield, the outer series of ventral shields entirely blue; the lower surface of the head with white, black-edged ocelli. Females more simply coloured and more of a greenish brown.

* 3 specimens from Genoa, one from Rapallo, one from Bagni di Ripoli.

† 5 on one side in two specimens from Lerici, in two from Bagni di Ripoli, in one from Tuscany, and on both sides in one from Lerici.

‡ Male from Tuscany. In two specimens from Bagni di Ripoli the upper temporal is in contact with the fourth supraocular.

The coloration, however, varies enormously, and the passage from the typical form is so complete that certain specimens may be referred almost equally well to the one form as to the other. For instance, one of the females from Lerici has the black network on the back much broken up and a well-marked light dorsolateral streak, and would be unhesitatingly referred to the f. *typica* but for the rather large black spots on the belly, arranged in regular longitudinal series. For it is frequently the case in this variety that the black ventral spots run together to form longitudinal bands. In some specimens from Tuscany the black may be as much developed on the lower parts as in an average specimen of the var. *nigriventris*. The dorsal markings are very variable, usually affecting the form of a close network, but sometimes appearing as disconnected blotches or vermicular lines; a vertebral chain of spots may be present. A male specimen from Florence, in Dr. de Bedriaga's collection, is almost identical with the usual form of the var. *albiventris*, being green above, with a vertebral band of black spots and black on the sides spotted with whitish. Black and white spots usually form very regular and conspicuous bars on the sides of the tail.

Dr. Gestro has very kindly sent me a large number of specimens collected indiscriminately in the immediate vicinity of Genoa; this series goes far to show the instability of the characters on which the distinction between the var. *brueggemanni* and the typical form rests. Some specimens are not at all separable from the latter, while others, of the most vivid grass-green on the back, answer to the former; and between these two extremes every possible gradation in shade may be followed. A female is green above, with a black vertebral series of spots, brown on the sides, yellow beneath. The back in others may be coppery-brown, or greyish brown, greenish grey or olive, or green in front and brown behind. The colour of the lower parts varies equally, and irrespective of that of the upper parts. Most specimens are white on the belly, often with a brownish, pinkish, or greenish tinge, uniform or more or less spotted with black; in one male with olive-green back the lower parts are copper-red, with black spots confined to the collar-plates and to the two outer rows of ventral plates. An interrupted or continuous series of turquoise-blue spots is always present on the outermost row of ventral plates. The back, in the males, is always much spotted or reticulated with black or dark brown, and a black vertebral line or regular series of spots is often present; the sides are brown or purplish, with black network, often enclosing round blue or green spots; a blue, black-edged ocellus is often present above the axil. One of these specimens is so strikingly

similar in its markings to certain males of the var. *quadrilineata*, that it might easily be mistaken for that variety were it not for the flatter head; and it is noteworthy that its exceptionally small scales (65 across the middle of the body) is a further approximation to the Corsican-Sardinian form. Camerano has already pointed out that some of the Ligurian specimens examined by him, with a much flattened head and reticulate markings, are suggestive of the var. *bedriagæ* from the mountains of Corsica. On the other hand, Bedriaga regarded the var. *brueggemanni* as forming the passage from the typical form to his var. *neapolitana* (*campestris* + *albiventris*), and it is a fact that some specimens approach the var. *albiventris*.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.
From end of snout to vent . .	65	60	64	62	68	65	62
,, ,, ,, fore limb .	27	21	26	24	27	25	24
Length of head	17	13	17	15	18	16	16
Width of head	11	9	11	9	11	11	11
Depth of head	8	6	8	6	9	8	6·5
Fore-limb	23	19	24	22	23	25	22
Hind limb	35	31	37	34	35	38	34
Foot	19	16	21	18	19	21	18
Tail	110	—	—	130	—	125	—

1. ♂, Rapallo. 2. ♀, Rapallo. 3. ♂ (type), Spezia. 4. ♀, Lerici. 5. ♂, Bologna. 6. ♂, Sestra Ponente. 7. ♂, Genoa.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Genoa	65	58	25	11	29	22–23	24
,, ,, ...	63	56	24	11	25	21–20	26
,, ,, ...	62	59	24	11	26	24–23	24
,, ,, ...	62	58	23	12	26	19	25
,, ,, ...	62	62	24	9	27	23	25
,, ,, ...	61	63	25	11	26	18	24
,, ,, ...	61	57	22	11	22	21	26
,, ,, ...	60	57	23	8	23	20	24
,, ,, ...	60	65	25	11	26	21–22	26
,, ,, ...	58	58	25	9	28	22–21	24
♀ ,, ...	62	59	30	10	28	21–20	?
,, ,, ...	59	60	26	9	28	19	24
♂ Sestra Ponente, nr. Genoa .	65	60	23	9	28	23	25
,, ,, ,, .	60	62	25	10	25	23–22	27

	1.	2.	3.	4.	5.	6.	7.
♂ Sestra Ponente, nr. Genoa	58	60	24	11	24	21–22	26
,, Rapallo	65	55	24	9	26	21	24
♀ ,,	60	57	26	10	27	17–18	24
♂ Portofino, nr. Rapallo	65	58	24	9	25	21–22	23
,, ,, ,,	64	53	25	10	27	20	24
♀ ,, ,,	60	59	26	8	25	21–22	24
♂ Spezia (type)	64	51	24	11	30	23–24	24
,, Lerici, nr. Spezia	68	58	24	10	26	25–22	26
,, ,, ,,	65	58	23	10	29	23	25
♀ ,, ,,	62	58	27	10	29	21-22	24
,, ,, ,,	54	59	27	12	25	22–20	25
♂ Bologna	68	54	26	10	24	21–20	28
,, ,,	66	53	25	9	22	18–19	25
,, Florence	65	52	25	9	19	18–17	27
,, ,,	65	61	24	9	26	19–20	29
,, Bagni di Ripoli, Florence	68	53	25	9	26	18–20	27
♀ ,, ,,	63	57	26	11	25	19–21	27
,, ,,	61	53	29	9	25	20–21	27
,, ,,	58	58	27	12	24	17–18	25
,, ,,	56	57	27	9	26	19	26
,, ,, ,,	56	59	28	9	26	21–22	28
♂ Tuscany	67	52	26	9	24	21–20	26
,, ,,	67	53	24	8	24	19	23
,, ,,	67	57	24	11	28	18–21	25
,, Mt. Meta, Terra di Lavoro	58	58	26	11	27	23–22	?

Columns as on p. 175.

The habitat of this variety is chiefly the West Coast of Italy, from Genoa to Tuscany; it is also known from Bologna, Elba, and Mt. Meta, Terra di Lavoro. It has been reported by Camerano from Naples, but the specimen has since been mislaid, as I am informed by Count Peracca. According to the latter the var. *brueggemanni* occurs in Liguria only near the sea; on the hills, from 100 metres upwards, only the ordinary grey brown typical form is found. In the Arno valley it follows the plain which extends inland rather far from the sea, and it even extends as high up as Florence, where examples intermediate between it and the typical form occur, as near Genoa.

In the province of Rome it is replaced by the following variety, into which it gradually merges.

Var. NIGRIVENTRIS.

Podarcis muralis, var. *nigriventris*, Bonap. Icon. Faun. Ital., Amf. (1836).

Lacerta muralis neapolitana, var. *nigriventris*, Bedriaga, Arch. f. Nat. 1879, p. 277, and Abh. Senck. Ges. xiv, 1886, p. 229 (part.).

Lacerta muralis fusca, var. *nigriventris*, Bedriaga, Arch. f. Nat. 1879, p. 288, pl. xvii, fig. 3.

Lacerta muralis neapolitana, var. *ventromaculata*, part., Bedriaga, Bull. Soc. Zool. France, 1879, p. 205.

Lacerta muralis, var. *flaviundata*, Bedriaga, t.c., p. 218.

Lacerta muralis, var. *nigriventris*, Bouleng. Tr. Zool. Soc. xvii, 1905, p. 384, pl. xxii, figs. 4–6, and pl. xxviii, fig. 1.

Lacerta muralis, var. *nigriventris*, part., Schreib. Herp. Eur., ed. 2, p. 411 (1912).

This variety hardly deserves to be separated from the preceding, and it would perhaps be preferable to unite them.

Head $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, more or less depressed, its depth equal to the distance between the anterior border or the centre of the eye and the tympanum. Hind limb reaching the shoulder or the collar in males, the axil in females. Foot not more than $1\frac{1}{3}$ times the length of the head, sometimes but slightly longer than the head.

Rostral not entering the nostril*; frontal as long as its distance from the end of the snout or a little shorter; occipital often as long as and sometimes much broader than the interparietal; series of granules between the supraoculars and the superciliaries incomplete,† the first, or the first and second, superciliaries in contact with the second supraocular‡; temporal scales granular, the tympanic and masseteric shields distinct; upper temporal shield, if distinct, not in contact with the fourth supraocular§; usually four upper labials anterior to the subocular.‖

20 to 29 scales between the symphysis of the chin-shields and the

* Forming a suture with the frontonasal in one specimen. Another is remarkable in having two superposed postnasals. A female from Ariccia has 3 frontonasals, the median the largest and in contact with the frontal.

† Complete in one specimen from Ariccia.

‡ In the type of var. *flaviundata* the granules are reduced to 3 or 4; even to 2 in a female from Ariccia.

§ Three exceptions among the Rome specimens; also in the S. Stefano specimen.

‖ 5 on each side in 3 specimens, on one side in 8.

median collar-plate, exceptionally 34*; gular fold distinct. Collar even-edged, composed of 8 to 11 plates.

Scales on body granular, oval or oval-subhexagonal, rather strongly keeled, 56 to 73 across the middle of the body, 37 (♀) to 51 (♂), transverse series corresponding to the length of the head, 4, or 3 and 4, corresponding to a ventral plate. 23 to 26 transverse series of ventral plates in males, 26 to 30 in females. Preanal plate large, with one or two semicircles of small plates.

Scales on upper surface of tibia strongly keeled, smaller than dorsals. 16 to 25 femoral pores on each side, usually 19 to 21. 26 to 31 lamellar scales under the fourth toe, exceptionally 24.

Upper caudal scales strongly keeled, narrow, very obtusely pointed behind; the whorls alternately longer and shorter, the difference often very great; 30 to 38 scales in the fourth whorl.

The coloration, which is the same in both sexes and in the young, is an exaggeration of the *brueggemanni* variety, the black predominating. Some specimens approach very nearly the reticulated type of this variety in having the middle of the back green with a black network, whilst in general the black has so invaded the upper parts that the yellow or green ground-colour is reduced to isolated small spots, which may be round or wavy and transverse, as in Bedriaga's var. *flaviundata*, with every passage between the two extremes. The sides are black, with round cream-coloured, yellow, or blue spots. The head in some specimens may be described as brown with black spots or vermiculations, in others as black with yellow or green variegations. The limbs are black, with yellow or green round spots. The lower parts are black and white, or brownish white, the black usually preponderating and often disposed in longitudinal bands, sometimes three in number; some specimens are nearly entirely black beneath, with mere remains of the white ground-colour. Large blue spots on the outer row of ventrals, but never forming a continuous band as in Bedriaga's figure of the var. *flaviundata*. Tail brown, with the black and white markings, usually so conspicuous in the typical form, very strongly defined and forming nearly complete annuli.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.
From end of snout to vent . .	64	76	67	66	52	62	78
„ „ „ fore limb . .	26	30	27	25	19	25	31
Length of head	17	20	18	15	13	15	19
Width of head	11	13	11	10	8	9	13
Depth of head	8	10*	9	7	6	7	8·5

* In the specimen from S. Stefano Id.

	1.	2.	3.	4.	5.	6.	7.
Fore limb	24	25	25	23	18	21	26
Hind limb	36	39	?	35	27	34	42
Foot	20	21	?	19	15	18	22

1. ♂ (type of var. *flaviundata*), Rome. 2, 3. ♂, walls of Rome. 4, 5. ♀, walls of Rome. 6. ♀, Castelfranco. 7. ♂, S. Stefano Id.

This lizard reaches a length of 85 millim. from snout to vent, according to the figure in Bonaparte's work.

Particulars of Specimens Examined.

		1.	2.	3.	4.	5.	6.	7.
♂	Rome (type of var. *flaviundata*)	64	62	25	10	22	18–19	27
,,	Outer walls of Rome	76	57	26	9	23	19–20	27
,,	,, ,,	73	67	25	9	26	19–20	29
,,	,, ,,	70	71	24	10	26	20–21	28
,,	,, ,,	67	64	25	8	25	19–20	29
,,	,, ,,	65	63	25	10	25	20–19	?
,,	,, ,,	65	64	24	10	23	21–20	28
,,	,, ,,	65	61	24	9	22	21	27
,,	,, ,,	64	64	24	8	22	21–22	31
,,	,, ,,	60	65	26	11	25	21–23	27
♀	,, ,,	66	58	27	9	24	19–18	29
,,	,, ,,	66	62	26	9	24	20	27
,,	,, ,,	52	64	26	9	24	20–21	31
,,	Castelfranco	62	64	28	11	29	21	30
,,	Campagna nr. Rome	67	65	29	9	26	20–19	28
♂	Ariccia, nr. Albano	72	57	24	9	22	18–19	26
,,	,, ,,	72	59	26	10	25	21–23	28
,,	,, ,,	71	62	24	8	25	23–25	29
,,	,, ,,	65	61	26	11	26	19–21	30
,,	,, ,,	65	58	23	9	25	17–18	27
,,	,, ,,	65	57	26	11	29	20–21	26
,,	,, ,,	63	59	26	8	26	23	27
,,	,, ,,	63	58	23	10	24	16–17	26
,,	,, ,,	61	58	25	10	25	22–21	28
,,	,, ,,	54	60	25	10	22	20	27
♀	,, ,,	67	56	28	9	23	21–20	30
,,	,, ,,	66	65	29	9	24	19–20	26
,,	,, ,,	66	59	29	8	23	23–21	29

		1.	2.	3.	4.	5.	6.	7.
♀	Ariccia, nr. Albano . .	66	58	30	9	23	20	24
,,	,, ,, . .	65	56	27	9	21	18	27
,,	,, ,, . .	65	56	28	9	21	18	27
,,	,, ,, . .	62	57	28	10	24	19–18	26
,,	,, ,, . .	62	63	27	10	24	21–20	27
,,	,, ,, . .	62	58	27	10	20	23	26
,,	,, ,, . .	62	59	28	9	24	19–21	26
♂	Naples, P.M. ,, . .	72	60	24	9	29	19	27
,,	,, ,, ,, . .	69	64	23	9	27	21–20	27
♀	,, ,, ,, . .	55	58	26	9	27	19–16	28
♂	S. Stefano Id., nr. Naples .	78	73	26	11	34	22	30

Columns as on p. 175.

This lizard is locally distributed in the Province of Rome. It is common on the ancient walls of Rome, where I have seen it climbing about in mid-winter in company with the var. *albiventris*. At Castelfranco, near Ostia, Dr. Sambon found it near woods. It is also reported from Arezzo in Tuscany and from Palmajola and Salina, Lipari Islands, but the correct identification is doubtful. Milne-Edwards, in his Monograph (Ann. Sc. Nat. xvi, 1829, p. 54), indicates its presence near Naples.*

A male specimen from San Stefano Island, near Naples, presented to the British Museum by M. G. de Southoff, appears to be referable to this variety, although the number of scales across the body and on the gular region is higher than in the other specimens. The head is strongly depressed, even slightly concave on the occiput; the upper parts are black, with small light spots, and each ventral plate is nearly entirely covered by a large black spot.

The predominating black coloration which renders this variety so striking is foreshadowed by some males of the typical *L. muralis*, but this feature is here not only exaggerated but has been passed on to the females and young, as has happened in the var. *filfolensis* from the Filfola Rock.

If the var. *nigriventris* be compared with the typical form, with which it is connected by a complete gradation, it will be observed that the increase in size and the gradual preponderance of the black markings go hand in hand with a reduction in the size of the dorsal scales and a consequent increase in their number.

* "D'autres, que j'ai trouvés près de Naples, ont, au contraire, le corps en dessous comme en dessus d'un noir de jais, avec des taches blanches irrégulières." I have examined three specimens from Naples (Savigny) preserved in the Paris Museum.

Var. INSULANICA.

Lacerta muralis neapolitana, part., Bedriaga, Arch. f. Naturg. 1879, p. 277.

Lacerta muralis neapolitana, subvars. *e* (part.) et *f*, Bedriaga, Bull. Soc. Zool. France, 1879, pp. 204 and 205.

Lacerta muralis reticulata, Eimer, Arch. f. Naturg. 1881, pp. 325 and 357, pl. xiii, fig. 12.

Lacerta muralis neopolitana, var. *insulanica*, Bedriaga, Bull. Soc. Nat. Moscou, lvi, 1882, p. 101.

Lacerta muralis neapolitana, subvars. *g* et *h* (part.), Bedriaga, Abh. Senck. Ges. xiv, 1886, pp. 228 and 229.

Lacerta muralis, var. *insulanica*, Bouleng. Tr. Zool. Soc. xx, 1913, p. 148, pl. xviii, figs. 1–3.

Very near the var. *brueggemanni*, but approaching the var. *bedriagæ*.*

Head rather strongly depressed.

The rostral does not touch the nostril. The series of granules between the supraoculars and the superciliaries is sometimes complete (it is so in the larger of the two types), but the first superciliary usually forms a suture with the supraocular. Parietal in contact with the upper postocular. Masseteric shield sometimes large, sometimes small, or broken up. Two specimens (♀) have 5 anterior labials on both sides, the others have 4.

Dorsal scales granular, feebly but distinctly keeled, 60 to 74 across the body, 40 to 67 transverse series in the middle of the back corresponding to the length of the head, 4 or 5 on the sides corresponding to a ventral plate. Tibial scales a little smaller than dorsals, very distinctly keeled. 19 to 26 femoral pores (exceptionally 18). 26 to 33 lamellæ under the fourth toe. The hind limb reaches the collar, or between the collar and the ear, in males, the axil in females.

In coloration often very similar to var. *bedriagæ*. Upper parts and sides of body and limbs green or yellowish with a black network

* "Le Lézard des Murailles provenant de l'île de Pianosa, laisse voir sur un beau fond vert des bandes noires transversales et ondulées. Les parties inférieures du corps sont bleuâtres. Les séries longitudinales de plaques ventrales qui confinent aux flancs sont d'un beau bleu marin tacheté de noir. Les formes de ce lézard offrent des caractères nouveaux. Sa tête est déprimée. le cou est fortement renflé et beaucoup plus large que la tête; son tronc est très épais. *Par ses formes, cette sous-variété paraît être très voisine du Lézard oxycéphale de Fitzinger* [read *L. bedriagæ*, Camerano]." Bedriaga, Bull. Soc. Zool. France, p. 205. I had quite independently arrived at the same conclusion on examining a specimen from Pianosa, near Elba.

which may have a tendency to form cross-bands as in var. *tiliguerta* (*tigris* of Eimer). Sometimes the black predominates to such an extent as to constitute the ground-colour on which the green appears as small round or vermicular spots, as in the var. *nigriventris*, or the lizard from Filfola Rock. Head pale brown above, with small or large black spots or vermiculations; lips often black, each shield with a light spot. White or pink beneath, throat with grey or blackish markings, the whole or the sides of the belly spotted with black; blue spots on the outer ventrals. Tail with regular cross-bars of black and white ocellar spots, most marked on the sides.

The specimens from the Scuola islet, near Pianosa, have more black on the belly than the others and closely resemble the var. *nigriventris*.

There is no marked sexual coloration-dimorphism, and the young, which I have seen in the Florence Museum, is reticulated, not streaked.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.
From end of snout to vent	80	72	68	62	68	70	66
„ „ „ fore limb	34	28	26	22	26	27	25
Length of head	22	19	18	14	17	19	17
Width of head	15	12	13	9	11	12	11
Depth of head	10	10	9	7	8	10	8
Fore limb	31	25	23	20	23	24	23
Hind limb	47	41	39	34	35	37	36
Foot	27	22	20	17	19	20	19

1. ♂, type, Pianosa (Bedriaga Collection). 2, 3. ♂, Pianosa. 4. ♀, Pianosa. 5. ♂, Scarpa, near Pianosa. 6. ♂, Scuola, near Pianosa (Bedriaga Collection). 7. ♂, Scuola.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Pianosa, type, B.C.	80	74	26	13	29	23–24	33
„ „ „ „	67	62	24	12	24	19	27
„ „	68	70	25	10	32	23	28
„ „	73	65	23	11	26	22–21	28
„ „	72	62	23	11	26	19–21	28
„ „	67	65	25	10	30	22	30
„ „	49	66	25	11	28	22	28
„ „	48	61	24	9	28	21–23	28
♀ „	62	63	28	8	27	26–25	31
„ „	62	61	27	9	24	24–21	28
„ „	59	60	27	11	26	21–20	26
♂ „	64	64	23	10	25	19	28

		1.	2.	3.	4.	5.	6.	7.
♂	Pianosa	63	65	24	12	27	23–21	28
„	„	61	72	25	11	26	22–23	26
♀	„	60	63	27	11	26	21	28
♂	Scarpa	68	67	24	12	26	19–18	?
„	„	68	63	23	11	30	21–20	26
„	„	65	65	24	10	24	22–21	26
♀	„	58	60	27	10	22	?	26
♂	Scuola	66	62	24	9	24	19	27
„	„	66	68	24	10	28	21–19	31
„	„	65	70	23	8	25	22–20	28
„	„ **B.C.**	70	63	23	12	26	19	28
„	„ **F.M.**	65	70	26	12	26	21–22	32
„	„ „	65	64	26	11	25	19	29

Columns as on p. 175.

This var. *insulanica*, which inhabits Pianosa near Elba and the neighbouring rocky islets Scarpa and Scuola, is not only a link between the typical *L. muralis* and the var. *bedriagæ*, but it may also be regarded as connecting the var. *brueggemanni* with the var. *tiliguerta*, differing from the latter in having the belly more or less spotted with black, at least on the sides.

Var. TILIGUERTA.

Tiliguerta, Cetti, Anf. Pesc. Sard. p. 15 (1777).

Lacerta tiliguerta, Gmel. Syst. Nat. iii, p. 1070 (1788); Camerano, Atti Acc. Torin. xiii, 1877, p. 87.

Lacerta olivacea, Rafin. Caratt. N. Gen. Anim. p. 8 (1819).

Lacerta puccina, Rafin. l.c.

? *Lacerta sicula*, Rafin. l.c.

Lacerta muralis, vars. *a*, *h*, *i*, *j*, *k*, part., Dum. & Bibr. Erp. Gén. v, p. 232 (1839).

Lacerta podarcis, var. *cettii*, Cara, Mon. Lacert. Sard. p. 30 (1872).

Lacerta muralis, var. *reticulata*, part., Schreib. Herp. Eur. p. 417 (1875).

Lacerta viridiocellata, Bedriaga, Arch. f. Nat. 1877, p. 116.

Podarcis muralis, vars. *tiliguerta*, *viridiocellata*, De Betta, Atti. Ist. Ven. (5) v, 1879, p. 389.

Lacerta muralis reticulata, *tigris*, part., Eimer, Arch. f. Nat. 1881, p. 325, pl. xiv, fig. 20.

Lacerta muralis, var. *tiliguerta*, Eimer, t.c. p. 362; Bouleng. Tr.

Zool. Soc. xvii, 1905, p. 409, pl. xxix, figs. 5, 6, and xx, 1913, p. 157, pl. xviii, fig. 7, and Ann. Mus. Genova (3), vi, 1915, p. 379.

Lacerta serpa, part., Camerano, Mon. Saur. Ital. p. 56, pl. i, fig. 1 (1885); Schreib. Herp. Eur., ed. 2, p. 444 (1912).

Lacerta muralis neapolitana, part., Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 220.

Lacerta muralis neapolitana, var. *viridiocellata*, part., Bedriaga, t.c. p. 240.

Lacerta muralis, var. *tiliguerta*, part., Bouleng. Cat. Liz. iii, p. 30 (1887).

Lacerta muralis, var. *cettii*, L. Müll. Zool. Anz. 1905, p. 502.

Lacerta muralis, var. *serpa*, part., Bouleng. Tr. Zool. Soc. xvii, 1905, p. 394, pl. xxvii, fig. 6.

Head $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, usually rather strongly depressed, the occiput quite flat or even slightly concave, sometimes however not differing from that of an average *L. m.* var. *albiventris*, its depth equal to the distance between the centre of the eye and the tympanum, its length $3\frac{1}{2}$ to 4 times in length to vent in males, 4 to $4\frac{1}{2}$ times in females. Pileus 2 to $2\frac{1}{3}$ times as long as broad. Neck as broad or a little narrower than the head. Body moderately depressed. Hind limb reaching between the collar and the ear in males, the axil, the shoulder, or the collar in females; foot $1\frac{1}{6}$ to $1\frac{1}{2}$ times the length of the head. Tail $1\frac{4}{5}$ to $2\frac{1}{3}$ times the length of head and body.

Rostral shield never entering the nostril, and usually separated from the frontonasal by the nasals*; postnasal single†; frontal as long as its distance from the end of the snout or a little shorter; series of granules between the supraoculars and the superciliaries usually incomplete, the first superciliary being in contact with the second supraocular; 6 to 8 superciliaries, the suture between the first and second usually oblique; parietals $1\frac{1}{3}$ to $1\frac{4}{5}$ times as long as broad; occipital as long as or shorter, and usually not broader, than the interparietal; usually four upper labials anterior to the subocular,‡ which is much shorter beneath than above; first upper temporal more often than not in contact with the fourth supraocular§; temporal scales granular,

* In 2 specimens from Sardinia, the rostral forms a suture with the frontonasal.

† 2 superposed postnasals in 5 cases out of 170 from Giglio.

‡ 5 in a male from Monte Cuccio, Sicily, and on one side in one from Grammichele, in 12 cases out of 170 from Giglio, in 2 cases out of 20 from Sardinia 3 in 2 cases from Giglio.

§ In 60 per cent. of the specimens examined.

small; tympanic shield distinct; masseteric shield sometimes large, usually small or absent.

24 to 35 scales between the symphysis of the chin-shields and the median collar-plate, usually 26 to 31; gular fold distinct. Collar with even or very slightly serrated edge, composed of 8 to 13 plates, usually 9 to 12.

Scales very small, convex, round or oval-hexagonal, feebly but distinctly keeled, 60 to 82 across the middle of the body, usually 65 to 76; 45 (♀) to 60 (♂) transverse series in the middle of the body correspond to the length of the head, 3 and 4, 4, or 4 and 5 on the sides correspond to a ventral plate. Ventral plates in 23 to 32 transverse series (23–28 in ♂, 26–32 in ♀).* Preanal plate rather small, with two semicircles of small plates.

Scales on upper surface of tibia feebly keeled, as large as or a little smaller than dorsals. 20 to 28 femoral pores on each side, usually 22 to 26. 28 to 37 lamellar scales under the fourth toe, usually 30 to 35.

Upper caudal scales strongly keeled and truncate or, rarely, very obtusely pointed, more or less oblique, and often grooved on each side of the keel; the whorls usually distinctly longer and shorter alternately, the fourth containing 30 to 40 scales.

Coloration and markings very variable, some specimens resembling the var. *albiventris*, others being absolutely identical with the var. *bedriagæ*.† Grey, greyish olive, greenish, or bright green on the back, grey brown on the sides, with black spots forming a reticulation, sometimes cross-bars, or with the spots on the vertebral region confluent into a wavy band, thus answering to the patterns *striato-maculata*, *reticulata*, and *tigris* of Eimer; sometimes the black spots form five regular longitudinal series; a blue or green ocellus above the axil and spots of the same colour on the outer ventral plates. Other specimens are uniform greyish brown, greyish green, or olive (*L. olivacea*, Raf., var. *modesta*, Eimer), whilst a third category are intermediate, the markings being present and also very variable, but brown instead of black and more or less effaced, thus connecting the two extremes. Upper surface of head often with large black spots or vermiculations; a more or less distinct dark streak on the side of the head, passing through the eye. Tail uniform, or with small dark and light spots, rarely with black and white spots forming more or less distinct bars.‡

* The plates of the outer row are divided into two in one specimen from Sardinia, and some specimens show an incomplete outer series.

† *Cf.* Tr. Zool. Soc. xx, 1913, pl. xviii, figs. 7 and 8.

‡ As pointed out by Dehaut (C. R. Soc. Biol. lxxxii, 1919, p. 514), the head and tail are never green.

The young, unless uniformly coloured, are reticulate, with a more or less distinct tendency for the vertebral spots to run together into a band and for the light ground-colour to appear as four longitudinal streaks. Lower parts white, with mother-of-pearl gloss, or slightly tinged with lilac-pink, sometimes grey in spirit, unspotted, except on the outer ventral plates, which, in males, are often spotted with black; very exceptionally small black spots near the outer border of the second ventral plate from the median line.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.	8.	9.
From end of snout to vent	87	70	70	59	72	75	71	72	63
„ „ „ fore limb	35	25	27	22	28	32	26	30	24
Length of head	23	16	18	14	18	20	16	19	15
Width of head	14	10	11	9	11	12	10	11	10
Depth of head	11	8	8·5	7	9	9	8	9	8
Fore limb	32	22	26	21	26	28	24	26	23
Hind limb	53	37	43	33	44	45	40	43	37
Foot	26	21	24	19	24	25	21	24	20
Tail	—	135	157	127	—	150	140	148	—

1. ♂, S. Sardinia. 2. ♀, Sardinia. 3. ♂, Giglio. 4. ♀, Giglio. 5. ♂, Gianutri. 6. ♂, Catania. 7. ♀, Catania. 8. ♂, Pantellaria. 9. ♀, Pantellaria.

Particulars of Specimens Examined.

Tuscan Archipelago:	1.	2.	3.	4.	5.	6.	7.
♂ Giglio Id.	70	71	26	11	31	23	31
„ „	66	76	25	11	34	28–26	33
„ „	66	75	25	13	34	27	35
„ „	63	73	25	13	29	25–24	33
„ „	63	73	25	11	27	22–24	30
„ „	62	71	24	12	32	24	31
♀ „	59	69	28	12	30	23	32
„ „	58	71	28	11	35	23–24	33
„ „	54	67	28	12	28	23–20	32
„ „	54	73	28	12	30	23–22	32
♂ Gianutri Id.	72	65	25	10	28	24–22	29
„ „	66	66	24	10	26	23–24	28
Sardinia:							
♂ Cagliari	73	71	26	10	30	25–26	32
„ „	72	77	26	8	28	23–24	34
„ „	70	68	26	11	27	23	32
„ „	62	78	24	11	30	23	32
♀ „	62	69	27	10	31	24–23	31
„ „	60	68	28	11	29	22–21	29

	1.	2.	3.	4.	5.	6.	7.
♂ Assemini	70	70	28	11	33	24–23	33
„ S. Sardinia	87	67	27	9	29	23	31
„ „	84	82	26	9	31	23	30
„ „	70	68	26	9	29	20	33
„ „	62	75	25	10	33	25	30
♀ „	65	74	28	10	27	22–23	31
♂ Sardinia	75	74	25	8	30	26	31
„ „	65	72	26	9	31	21–25	32
♀ „	70	66	29	12	28	23–22	31
„ „	70	69	31	11	27	21–23	30
„ „	53	65	29	12	27	22–21	33
♂ Carloforte, S. Pietro Id.	72	71	25	11	26	22–24	29
♀ „ „	57	71	27	9	29	22	30
SICILY :							
♂ Messina	76	74	26	12	31	25	33
„ „	74	76	23	12	27	22–24	34
♀ „	68	70	27	9	25	24–23	31
„ „	65	68	27	10	26	23–25	32
♂ Tarmina	67	75	25	11	31	27	33
„ „	67	70	28	10	28	25–23	30
„ „	65	67	27	12	24	23–24	32
♀ „	59	68	30	8	26	23–24	33
„ „	56	68	30	10	28	24–22	33
♂ Catania	84	76	24	13	27	25	31
„ „	75	77	27	13	29	24–25	35
„ „	75	71	25	11	27	23–22	29
„ „	56	60	26	9	25	22–23	31
♀ „	71	66	28	9	27	21–22	30
„ „	66	69	30	10	27	24	30
„ „	63	69	27	10	27	23–22	32
♂ Grammichele, Prov. Catania	73	75	26	12	28	25	30
♀ „ „ „	73	68	28	11	26	23–22	30
„ „ „ „	59	72	29	12	28	25–26	32
♂ Syracuse	64	65	26	13	27	25–23	31
„ Modica	69	73	25	11	29	26–27	31
♀ „	66	65	29	11	27	23–22	28
♂ Palermo	74	71	26	10	29	24	31
„ „ W.C.	70	73	26	11	29	28–26	35
„ „ „	70	74	28	11	29	26	31
♀ „	65	68	27	11	26	22–23	32
„ „ W.C.	61	65	28	11	26	23–21	30

	1.	2.	3.	4.	5.	6.	7.
♂ Monte Cuccio . . .	73	79	27	11	29	25–23	30
♀ ,, ,, . . .	70	70	31	11	29	23–22	31
,, Marettimo Id., Egades Ids. .	65	72	30	10	26	20–21	32
Lipari Ids.:							
♀ Stromboli Id. . . .	61	71	28	10	31	23–26	34
,, ,, . . .	58	67	28	9	32	24–25	33
♂ Salina Id.	65	73	24	12	30	27–26	32
,, ,, ...	65	72	26	13	27	23–25	33
,, ,, ...	64	77	26	9	27	23–25	34
♀ ,, ...	61	72	27	10	28	23–24	29
,, ,, ...	61	75	29	11	29	23	?
,, ,, ...	60	70	28	11	26	23	30
♂ Lipari Ids.	69	73	26	9	28	24–23	33
♀ ,, ...	63	75	30	9	32	26	36
Pantellaria Id.:							
♂ Kamma	75	75	25	11	31	25–27	32
,, ,, ...	72	71	26	10	32	25–26	35
,, ,, ...	70	75	25	9	29	24	33
♀ ,, ...	63	67	27	9	27	25–24	32
,, ,, ...	63	70	29	11	26	25–27	30
Tunisia:							
♂ Tunis (T.M.) . . .	63	72	27	10	28	23	30
Balearic Ids.:							
♀ Binisaida, Minorca . .	70	70	30	8	30	23	30
♂ Marcadal, ,, . .	77	75	26	10	27	22	31

Columns as on p. 175.

Habitat.—Tuscan Archipelago (Giglio, Gianutri), Sardinia, Lipari Islands, Sicily, Pantellaria, Tunis, and Minorca.

This variety approaches in many respects the var. *bedriagæ*, and since expressing my views on this subject I have accidentally come across a previously published note by J. Scherer* in which, alluding to Sicilian examples under the name of *L. serpa*, var. *reticulata*, Schreiber, he observes that it is distinguished from the var. *albiventris* by a more powerful and larger build, an unusually broad, folded neck, a more depressed skull, often more swollen cheeks, frequently without masseteric shield, and a remarkably long tail, which may be nearly three times as long as head and body. These characters are among

* Bl. Aq. Terr. K. xiv, 1903, p. 242, fig.

those to which Méhely has appealed in 1909 in order to justify the specific rank of *L. bedriagæ*.

Var. BEDRIAGÆ.

Lacerta oxycephala, part., Dum. & Bibr. Erp. Gén. v, p. 235 (1839); Bedriaga, Arch. f. Nat. 1880, p. 250, pl. xi.

Podarcis oxycephala, Bonap. Icon. Faun. Ital., Amf. (1840).

Lacerta oxycephala, var. *reticulata*, Bedriaga, Bull. Soc. Nat. Mosc. 1881, p. 82.

Lacerta oxycephala, var. *bedriagæ*, Camerano, Zool. Anz. 1885, p. 418, and Mon. Saur. Ital. p. 48 (1885).

Lacerta bedriagæ, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 284; Peracca, Boll. Mus. Torin. xx, 1905, no. 519, pl. —; Schreib. Herp. Eur., ed. 2, p. 387 (1912).

Lacerta muralis, var. *bedriagæ*, Bouleng. Cat. Liz. iii, p. 34 (1887), Tr. Zool. Soc. xvii, 1905, p. 411, pl. xxiii, fig. 5, pl. xxviii, fig. 8, and pl. xxix, fig. 7, and xx, 1913, p. 151, fig., pl. xviii, fig. 8.

Lacerta reticulata (non Schreib.), Méhely, Ann. Mus. Hung. vii, 1909, p. 476, pl. xvi, figs. 7–9, and pl. xvii, figs. 1–9.

Head about $1\frac{1}{2}$ times as long as broad, much depressed, the occipital region flat or slightly concave, its depth equal to the distance between the posterior border of the eye and the tympanum, its length $3\frac{1}{2}$ to $3\frac{3}{4}$ times in length to vent in males, 4 to $4\frac{1}{4}$ times in females; cheeks much swollen in the males; snout more or less pointed, not longer than the postorbital part of the head. Pileus 2 to $2\frac{1}{4}$ times as long as broad. Neck as broad as or a little broader than the head. Body and limbs rather stout, much depressed. Hind limb reaching the shoulder, the collar, or a little beyond in males, the axil or the shoulder in females. Tail rather strongly depressed at the base, $1\frac{1}{2}$ to slightly over 2 times as long as head and body.

Rostral shield not touching the nostril; nasals forming a short or very short suture behind the rostral, rarely separated from each other*; sometimes two superposed postnasals†; frontal as long as its distance from the end of the snout, or a little longer, or considerably shorter; a usually complete series of granules between the supraoculars and the superciliaries,‡ which number 6 or 7 (rarely 8 or

* In 3 specimens out of 28 examined by me, in 2 specimens out of 21 examined by Méhely.

† In 8 cases out of 56 examined by me, in 3 cases out of 42 examined by Méhely.

‡ In 5 cases the first superciliary is in contact with the second supraocular.

9), the suture between the first and second sometimes vertical, sometimes oblique; parietals 1½ to 1¾ times as long as broad, often not in contact with the upper postocular*; occipital usually broader and as long as or longer than the interparietal, sometimes fused with it or separated by an additional shield; anterior upper temporal sometimes large, sometimes broken up into scales; temporal scales granular, not much larger than dorsals; tympanic shield present; masseteric shield moderately large, or small, or absent; four or five, rarely six upper labials† anterior to the subocular, the lower border of which is not or but little shorter than the upper.

26 to 39 scales and granules in a longitudinal line between the symphysis of the chin-shields and the median collar-plates, usually 32 to 35; gular fold usually distinct. Collar with even edge, the plates usually small, 7 to 13 in number, usually 9 to 12.

Scales on body smooth, granular and feebly convex, roundish-hexagonal and flat on the posterior part of the back, a little larger on the back than on the flanks; 58 to 78 scales across the middle of the body,‡ usually 65 to 72; 30 (♀) to 56 (♂) transverse series, in the middle of the back, correspond to the length of the head, 4 and 5 (rarely 4 or 3 and 4) on the side correspond to a ventral plate. Ventral plates in 24 to 28 transverse series (in males as well as in females).§ Preanal plate rather large, with a single semicircle of small plates, rarely with two.

Scales on upper surface of tibia minute, smaller than dorsals, likewise smooth; 19 to 27 femoral pores on each side,‖ usually 22 to 25. 26 to 31 lamellar scales under the fourth toe.

Caudal scales longer and shorter in alternate whorls, the upper feebly keeled, sometimes even nearly smooth, truncate behind; 28 to 40 scales in the fourth or fifth whorl behind the postanal granules.

Greyish, yellowish brown, dull green or bright green above, with a more or less developed wide-meshed brown or black network, or blackish

* In contact in 20 cases out of 56. As Méhely has attached a great importance to the condition of the shield in his classification, it is worth mentioning that this lizard does not differ in any way, in this respect, from the var. *liliguerta*.

† 5 on each side in 7 specimens, 4 on each side in 6, 4 on one side and 5 on the other in 15, 6 on each side in one.

‡ 62–84 according to Méhely.

§ According to Méhely, the median or the outer plates may be exceptionally divided, making 8 longitudinal rows instead of 6.

‖ Up to 29 according to Méhely.—The pores sometimes as small in males as in females.

with round pale olive spots*; small blue spots may be present on the sides; upper surface of head more or less spotted or vermiculated with black; markings on the tail absent or ill-defined. Lower parts greyish or greenish white, salmon-pink, or copper-red, with or without small black spots; a series of green or blue spots on the outer row of ventral shields. Markings of the young as in the adult.

Measurements (in millimetres):

	1.	2.	3.	4.
From end of snout to vent	80	73	70	55
„ „ „ fore limb	34	30	27	22
Length of head	22	20	17	13
Width of head	15	13	12	9
Depth of head	10	9	8	6
Fore limb	31	27	25	21
Hind limb	47	42	37	32
Foot	27	21	19	16
Tail	—	137	112	112

1. ♂, type, Bastelica (Bedriaga Coll.). 2. ♂, Corsica. 3, 4. ♀, Corsica.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Bastelica (type), **B.C.**	80	78	25	11	35	22	29
„ „ „ „	75	77	28	10	35	25	?
♀ „ „ „	75	67	27	12	30	22–23	27
♂ „ **P.M.**	82	72	26	9	31	25–26	28
„ Tinozzo	75	66	24	9	31	25	28
„ Vizzavona	75	67	25	11	29	21–22	27
♀ „	71	65	24	10	35	25–26	26
„ „	71	74	26	10	31	21–22	26
„ „	68	65	26	9	30	22	28
♂ „	80	69	25	11	33	26–25	30
„ „	80	66	25	11	33	24–26	31
♀ „	82	67	26	10	32	22	28
„ „	80	62	26	11	26	21–19	27
„ „	54	75	28	10	39	24	29
♂ Corsica	82	76	26	12	33	25	28
„ „	78	66	25	10	32	26–25	30
„ „	73	72	25	12	35	23–21	26
„ „	65	71	28	12	33	24–23	29
„ „	60	70	24	7	33	22–24	30

* Schreiber mentions rare cases in which the light spots are arranged in regular longitudinal series corresponding to the light streaks of other varieties.

	1.	2.	3.	4.	5.	6.	7.
♂ Corsica	58	58	24	9	32	23	27
♀ ,, ...	70	72	25	9	35	24–25	29
,, ,, ...	55	70	26	9	32	23	27
,, ,, P.M.	75	73	27	11	?	24	29
,, ,, ,, ...	70	69	26	9	30	72	26

Columns as on p. 175.

Habitat. – Mountains of Corsica, between 700 and 2700 metres altitude.

This form is so striking for the great depression of the head and body that it has been regarded by most authors as entitled to specific rank, or has even been united with *L. oxycephala*. It is however connected with *L. muralis* by intermediate forms, such as the vars. *tiliguerta* and *insulanica*, and when the characters of these are taken into consideration it will be found that the var. *bedriagæ* is difficult of definition; the difficulty is further increased if we also compare *L. bedriagæ* with the Asiatic forms formerly held as specifically distinct under the name of *L. depressa*. In my opinion, the difference between the var. *bedriagæ* and the var. *tiliguerta* is not greater than that between the latter and the var. *campestris*, perhaps even less.

Var. SARDOA.

Lacerta sardoa, Peracca, Boll. Mus. Tor. xviii, 1903, no. 458, fig., and xx, 1905, no. 519, pl. —; Schreib. Herp. Eur., ed. 2, p. 391 (1912).

Lacerta bedriagæ, part., Méhely, Allat. Közlem. Budapest, iii, 1904, p. 194.

Lacerta muralis, var. *sardoa*, Bouleng. Tr. Zool. Soc. xvii, 1905, p. 413, pl. xxviii, fig. 9, and pl. xxix, fig. 8, and xx, 1913, p. 154.

Lacerta reticulata, var. *sardoa*, Méhely, Ann. Mus. Hung. vii, 1909, p. 487, pl. xvi, figs. 1–6.

Head $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, much depressed, the occipital region flat or slightly concave, its depth not greater than the distance between the posterior border of the eye and the tympanum, its length $3\frac{2}{3}$ to 4 times in length to vent in males, $3\frac{3}{4}$ to $4\frac{1}{2}$ times in females; snout more or less pointed, not longer than the postorbital part of the head. Pileus 2 to $2\frac{1}{3}$ times as long as broad. Neck as broad as or a little broader than the head. Body much depressed. Hind limb reaching the shoulder, the collar, or a little beyond the collar in males, the axil or not quite so far in females; foot as long as or a little longer than the head.* Tail $1\frac{1}{2}$ to 2 times as long as head and body.

* A little shorter in a male measured by Méhely.

Rostral shield not touching the nostril, usually forming a suture with the frontonasal,* which is often as long as broad or even a little longer; postnasal single; frontal as long as its distance from the end of the snout, $1\frac{2}{3}$ to nearly 2 times as long as broad; a complete series of granules between the supraoculars and the superciliaries, which number 5 or 6, the suture between the first and second vertical or oblique; parietals $1\frac{1}{3}$ (young) to nearly twice as long as broad; occipital usually shorter than the interparietal, with which it is sometimes fused†; usually 4 upper labials, rarely 5‡ anterior to the subocular, the lower border of which is not or but little shorter than the upper; first upper temporal rarely in contact with the fourth supraocular§; temporal scales granular, small; tympanic shield distinct; masseteric shield very small or absent.

29 to 38 scales between the symphysis of the chin-shields and the median collar-plate, usually 30 to 35; gular fold distinct. Collar with even edge, composed of 11 to 15 small plates, usually 11 to 13.

Scales very small, granular, flat, smooth, 62 to 76 across the middle of the body, usually 64 to 72‖; 32 (♀) to 47 (♂) transverse series in the middle of the back, correspond to the length of the head, 4 or 4 and 5 on the sides correspond to a ventral plate. Ventral plates in 23 to 26 transverse series (23 to 25 in males, 23 to 26 in females).¶ Preanal plate moderately large or rather small, with two semicircles of small plates.

Scales on upper surface of tibia smooth, smaller than dorsals. 21 to 31 femoral pores on each side, usually 21 to 28; frequently a second, incomplete series of rudimentary pores. 26 to 31 lamellar scales under the fourth toe.

Upper caudal scales smooth or feebly keeled, truncate, rather oblique, the whorls very markedly longer and shorter alternately; 26 to 34 scales in the fourth whorl.

The type specimen is black above, with very numerous small round greenish light spots, the head being brown with a black reticulation;

* Out of 40 specimens from Mt. Gennergentu only 3 lack the suture, the nasals meeting with their inner angles, according to Peracca; in 3 specimens from Mt. Limbara, preserved in the Florence Museum, the nasals are narrowly in contact with each other behind the rostral.

† In 11 specimens according to Peracca, in 2 specimens in the British Museum; separated by an accessory shield in the third specimen in the British Museum.

‡ In 14 cases out of 54 according to Peracca.

§ 3 exceptions noted by Peracca.

‖ 74–82 according to Méhely.

¶ 8 longitudinal rows in 2 specimens examined by Peracca, in 3 examined by Méhely.

greyish white beneath, the ventral plates edged with black in front; outer ventral plates blue. Other specimens have the spots larger and fewer, surrounded by a black network, much as in many specimens of the var. *bedriagæ*, or ocellar and distinct from the olive ground-colour; the ocelli may have a tendency to unite by their black borders to form cross-bars; lower parts grey, uniform in females or spotted with black in males, the outer ventral plates with black and blue spots. Tail with markings same as on the body, or forming very irregular cross-bars. Young with markings similar to those of the adult and likewise without any trace of striation.

Measurements (in millimetres):

	♂			♀			
From end of snout to vent	82	76	57	78	74	70	58
,, ,, ,, fore limb.	—	—	23	32	29	31	24
Length of head	21	19	15	19	17	19	15
Width of head	13	12	9	11	10	11	9
Depth of head	8·25	7·5	6	8	8	8	5
Fore limb	28	27	22	26	26	26	21
Hind limb	43	42	33	39	37	40	32
Foot	21	21	17	20	19	20	17
Tail	—	132	97	—	110	128	—

First and second columns after Peracca.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂	57	73	24	12	32	23–24	28
♀	78	68	25	12	33	25–26	31
,,	74	65	26	13	34	25–26	28
,, (type, **T.M.**)	70	72	26	13	35	25–24	29
,,	58	76	25	13	30	24–25	28

The following are given by Peracca:

	1.	2.	3.	4.	5.	6.		1.	2.	3.	4.	5.	6.
♂	82	76	25	13	35	24	♀	67	62	26	13	29	21–22
,,	77	70	24	11	34	24–26	,,	65	71	24	13	34	31–29
,,	76	70	23	12	31	23–24	,,	65	69	25	11	34	23–24
,,	76	71	25	13	35	28–27	,,	62	67	23	11	31	27–26
,,	74	71	24	15	37	28–30	,,	59	74	24	13	38	26–25
,,	73	71	24	14	34	26	,,	57	74	23	11	33	28–25
♀	76	65	26	11	30	22–23	,,	56	66	26	12	34	25–26
,,	75	70	26	11	36	24–25	,,	55	71	25	13	38	25–24
,,	74	65	26	12	30	24	,,	55	72	24	11	32	25–26
,,	73	64	24	12	31	22–23	,,	50	67	25	13	31	21–23
,,	73	67	25	13	32	22–23	,,	50	75	24	13	35	25–27
,,	73	64	25	11	30	21–23	,,	49	70	26	13	35	23
,,	72	72	26	15	35	25–27	,,	45	64	24	11	31	21–22

Columns as on p. 175.

Habitat.—This lizard appears to have a very restricted habitat on the mountains of Sardinia. Most of the specimens, including the type, were obtained on Mt. Gennergentu. Three specimens, from Mt. Limbara, are preserved in the Florence Museum.

It is so closely allied to *L. bedriagæ* that it was first held to be identical with it by Méhely. In his latest contribution the same author regards it as a geographical variety, a view in which I concur. The two forms can only be distinguished by a combination of characters, not one of which is constant. It is not improbable, however, that the resemblance between the two lizards is a case of parallelism and that both have been independently derived, as mountain forms, from a common ancestor, of which the var. *tiliguerta* is the survivor.

Group IV.—Spain and Portugal, North-West Africa.

A few varieties are here grouped together, which are closely allied to and no doubt derived from the typical form, from which some of them are barely distinguishable and with which most agree in the absence of vivid green colour. In the first two varieties a dark vertebral streak or series of spots is primarily present, whilst it has been lost in the others. In addition to this character, the following definitions will help in their identification.

Var. *liolepis*, Blgr.—Head moderately depressed; scales smooth or faintly keeled, 51 to 65 across the body; upper caudal scales smooth or feebly keeled; collar-plates usually very small; 15 to 22 femoral pores; 21 to 27 lamellar scales under the fourth toe; masseteric shield usually very small or absent. From snout to vent up to 60 millim.—Spain.

Var. *hispanica*, Stdr.—Head much depressed, snout acutely pointed; scales smooth, 50 to 60 across the body; collar-plates very small; 14 to 19 femoral pores; 25 or 26 lamellar scales under the fourth toe; masseteric shield usually absent; often 5 upper labials anterior to the subocular. From snout to vent up to 50 millim.—S. Spain.

Var. *vaucheri*, Blgr.—Head moderately depressed; scales distinctly keeled, 61 to 76 across the body; 13 to 19 femoral pores; 23 to 28 lamellar scales under the fourth toe; masseteric shield usually present. From end of snout to vent up to 52 millim.—S. Portugal and Morocco.

Var. *bocagii*, Seoane.—Head more or less depressed; scales smooth or feebly keeled, 50 to 67 across the body; 14 to 22 femoral pores; 21 to 29 lamellar scales under the fourth toe; masseteric shield often

small or absent. From snout to vent up to 65 millim.—Spain and Portugal, Morocco, Algeria, W. Tunisia.

Var. *monticola*, Blgr.—Head much depressed, snout very obtuse; scales flat, smooth or faintly keeled, 46 to 52 across the body; 14 to femoral pores; 23 to 26 lamellar scales under the fourth toe; masseteric shield large; rostral in contact with the frontonasal. From snout to vent up to 76 millim.—Mountains of Spain and Portugal.

Var. LIOLEPIS.

Lacerta muralis fusca, var., Bedriaga, Arch. f. Nat. 1879, p. 292.

Lacerta muralis, var. *liolepis*, Bouleng. Tr. Zool. Soc. xvii, 1905, p. 363, pl. xxiv, figs. 9, 10.

Bedriaga has briefly alluded to this small form, which he observed alive at Valencia, on the road to the Dehesa de la Albufera, and which struck him as remarkable for the extremely small dorsal scales and smooth caudal scales, the middle dorsals of which are more or less enlarged. The colour is described as a pale yellowish brown above, with a brown, white-edged lateral band, greyish or yellowish beneath. Length from snout to vent 49 millim.

Among numerous specimens from Valencia which are preserved in the British Museum and in the Lataste Collection, some agree with Bedriaga's description in having the upper caudal scales very faintly keeled, almost smooth, and the granular dorsal scales are very minute, scarcely larger than those on the upper surface of the tibia. Some specimens, however, have the dorsal scales larger, and the caudal scales distinctly, though rather feebly, keeled, and yet evidently belong to the same form.

Although I have bestowed a name on it, I do not think it possible to sharply define this form, which may be said to connect the typical *L. muralis* with the var. *hispanica*.

Proportions and shape of head as in the typical form, snout pointed; the depth of the head equals the distance between the anterior corner or the centre of the eye and the tympanum; hind limb reaching the axil, the shoulder, or the collar in males, the elbow or the axil in females; foot a little longer than the head; tail $1\frac{2}{3}$ to 2 times as long as head and body.

Rostral not touching the nostril*; frontonasal rarely in contact with the frontal†; frontal as long as or shorter than its distance from the

* In contact with the frontonasal in two specimens from Valencia, and in one from Foyos.

† In two specimens from Valencia.

end of the snout; parietal 1½ to 1⅔ times as long as broad, in contact with the upper postocular; occipital usually shorter, but often broader than the interparietal*; series of granules between the supraoculars and the superciliaries usually incomplete; suture between the first and second superciliaries usually oblique, rarely vertical; 4 upper labials† anterior to the subocular, which is much narrower beneath than above; temporal scales granular, usually not larger than the dorsals, sometimes even smaller; upper temporal shields usually broken up into scales; masseteric shield sometimes moderately large, usually very small or absent.

25 to 36 gular scales between the symphysis of the chin-shields and the median collar-plate; gular fold distinct. Collar even-edged, composed of 9 to 12 plates (rarely 8 or 14), which are usually very small.

Scales granular, round or oval-subhexagonal, smooth or faintly keeled, 51 to 65 across the middle of the body, usually 56 to 62; 42 to 56 transverse series, in the middle of the back, correspond to the length of the head, 3 or 4 on the side to a ventral plate. Ventral plates in 23 to 28 transverse series in males, 27 to 32 in females.‡ Preanal shield moderately large, or rather small.

15 to 22 femoral pores on each side, usually 16 to 19; 21 to 27 lamellar scales under the fourth toe, usually 22 to 25.

Caudal scales very oblique, forming alternately longer and shorter whorls, upper feebly or faintly keeled, rarely smooth, truncate or very obtusely pointed behind; 28 to 36 scales in the fourth or fifth whorl behind the postanal granules.

In their markings the young are quite similar to those of the typical form from France, and a black vertebral streak is likewise often present. The adults are pale grey or brown above, and the blackish spots, if present, are small; a median series of black spots or a more or less distinct black vertebral line are often present as well as another on the inner side of the light dorsolateral streak; a dark brown or dark grey lateral band, sometimes edged with white above or above and below; upper surface of head uniform or with dark dots. Ventral spots are absent or small and confined to the sides; one male specimen from Valencia is exceptional in having the lower parts dotted all over with black.

* Twice as broad in one specimen from Valencia and in one from Foyos; longer than the interparietal in a specimen from Cadix.

† 5 on one side in one specimen from Valencia, in one from Foyos and in one from Seville.

‡ 8 longitudinal series in one specimen from Valencia.

Measurements (in millimetres):

	♂.	♀
From end of snout to vent . . .	60	50
„ „ „ fore limb . .	24	19
Length of head	15	12
Width of head	10	8
Depth of head	8	6
Fore limb	20	16
Hind limb	33	24
Foot	17	13
Tail	120	89

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Valencia	60	57	27	10	33	18	25
„ „	60	55	26	12	28	17–16	26
„ „	59	58	26	9	27	18	21
„ „	57	63	25	9	28	21–22	25
„ „	55	62	28	14	34	20	24
„ „	55	58	26	9	27	18	24
„ „	55	61	26	10	30	17	23
„ „	54	61	25	11	28	21–19	27
„ „	53	58	25	10	28	16	22
„ „	53	52	27	10	30	20–18	27
„ „	52	59	27	12	29	18–21	24
„ „	51	59	28	11	28	18–19	24
„ „	49	64	23	10	27	18	25
♀ „	54	59	30	11	25	17	25
„ „	53	60	29	9	30	18–16	26
„ „	53	54	27	11	27	17–19	26
„ „	53	60	30	10	26	16	22
„ „	50	60	31	11	30	17	25
„ „	50	62	30	11	33	17–18	22
„ „	47	56	31	12	31	18–16	25
„ „	46	53	28	11	28	16	25
„ „	45	58	29	9	29	18	25
„ „	45	59	28	11	30	16	25
„ „	44	59	30	12	27	18–19	21
♂ Foyos, near Valencia . .	55	59	25	12	27	18	24
„ „ „ . .	49	61	25	11	30	18	23
„ „ „ . .	51	51	30	8	28	18–19	24
„ „ „ . .	47	58	30	11	28	17–18	22

	1.	2.	3.	4.	5.	6.	7.
♀ Foyos, near Valencia . .	47	57	32	11	29	17–18	22
„ „ „ . .	47	56	29	10	28	15	23
♂ Cadix (**P.M.**)	60	61	28	11	26	17–19	26
„ „ „	58	64	26	10	29	20–19	24
„ Seville	52	62	28	11	26	19–20	25
♀ „	50	57	29	11	28	19	25

Columns as on p. 175.

Habitat.—This variety is only known from the vicinity of Valencia and from Seville and Cadix.

Var. HISPANICA.

Lacerta oxycephala, var. *hispanica*, Steind. Sitzb. Ak. Wien. lxii, 1, 1870, p. 336, pl. i, figs. 3-6; Boettg. Abh. Senck. Ges. xii, 1881, p. 376.

Lacerta oxycephala, part., Schreib. Herp. Eur. p. 404 (1875).

Lacerta muralis fusca, var., Bedriaga, Arch. f. Nat. 1879, p. 293.

Lacerta muralis steindachneri, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 256.

Lacerta muralis, var. *hispanica*, Bouleng. Cat. Liz. iii, p. 33 (1887), and Tr. Zool. Soc. xvii, 1905, p. 368, pl. xxiv, fig. 14, and pl. xxv, figs. 14, 15.

Lacerta hispanica, Schreib. Herp. Eur., ed. 2, p. 429 (1912).

A small form which, in its much flattened head, sharply-pointed snout, and conspicuously striated body, suggests a young *Acanthodactylus*.

Head and body much depressed; head $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad.* Hind limb reaching the axil or the shoulder; foot about $1\frac{1}{3}$ times the length of the head. Tail twice as long as head and body, or a little more or a little less.

Rostral not touching the nostril; frontal nearly twice as long as broad, as long as its distance from the end of the snout; series of granules between the supraoculars and the superciliaries complete or first superciliary in contact with the second supraocular; parietals about $1\frac{1}{2}$ times as long as broad, not touching, or barely touching the upper postocular; occipital shorter than the interparietal and as broad or broader; frequently 5 upper labials† anterior to the sub-

* $2\frac{1}{2}$ times in Schreiber's description is evidently a lapsus.

† Of the 3 specimens examined one has 5 on both sides, a second has 5 on one side and 4 on the other, whilst the third has 4 on both sides.

ocular, which is narrower beneath than above; temporal scales granular, usually without masseteric shield. 26 to 29 scales between the symphysis of the chin-shields* and the median collar-plates; gular fold feeble or scarcely indicated. Collar even-edged, composed of 8 to 11 very small plates.

Scales small, flat, smooth, roundish, 50 to 60 across the middle of the body; 3 or 4 correspond to a ventral plate. Ventral plates in 26 to 30 transverse series. Preanal plate moderate or large, bordered by one or two semicircles of small plates.

Scales on upper surface of tibia as large as or a little smaller than dorsals. 15 to 19 femoral pores on each side.† 25 or 26 lamellar scales under the fourth toe.

Caudal scales oblique, feebly keeled, truncate, not forming very unequal whorls.

Grey above, with five or seven longitudinal blackish streaks, which may bear small light spots, or may be broken up into spots; the vertebral streak sometimes divided into two on the nape; the dorso-lateral black streaks extending forward to the parietal shields or to the supraocular shields; the dark lateral streak, passing through the eye, broadest. In the young the black streaks may be separated by pure white. Limbs with light, black-edged round spots. Tail bluish, with black spots or annuli. Lower parts whitish, uniform or with a series of round black spots on the outer ventral shields.

This lizard does not appear to exceed a length of 50 millim. from snout to vent.

Habitat.—According to Steindachner large numbers were found on the Monte Agudo near Murcia, and on rocky situations in the neighbourhood of Alicante. It is also known from Almeria. Schreiber says it is common in rocky places on the Mediterranean coast of Spain between Alicante and Malaga.

Notwithstanding its oxy-platycephalous character, which has misled Steindachner and Schreiber as to its affinities, this lizard is very closely related to the preceding variety and bears no near relationship to the var. *bedriagæ* or to *L. oxycephala*. Its head is, besides, not flatter than in certain examples of the var. *bocagii*, and its system of coloration is much more primitive.

* One of the species from Almeria has 4 pairs of chin-shields meeting in the middle.

† 14 to 18 according to Bedriaga.

Var. VAUCHERI.

Lacerta muralis, var. *fusca*, Boettg. Abh. Senck. Ges. xiii, 1883, p. 110.

Lacerta muralis, part., Bouleng. Tr. Zool. Soc. xiii, 1891, p. 125; Doumergue, Herp. Oran. p. 125, pl. viii, fig. 7 (1901).

Lacerta muralis, var. *vaucheri*, Bouleng. Tr. Zool. Soc. xvii, 1905, pp. 365, 418, pl. xxix, fig. 9.

This variety, which is only known from Tangier and the Portuguese province of Algarve, differs but little from the typical form, the principal distinction lying in the smaller scales and the absence of a dark vertebral streak or series of spots, the latter feature being shared by the two following varieties and several others from S.W. Asia.

Head rather short, not more than $1\frac{1}{2}$ times as long as broad, and moderately depressed, its depth equalling the distance between the anterior corner of the eye and the tympanum. Hind limb reaching the shoulder in males, the elbow in females; foot $1\frac{1}{6}$ to $1\frac{1}{3}$ times the length of the head. Tail $1\frac{2}{3}$ to 2 times as long as head and body.

Head-shields as in the typical form, but parietals rather shorter, usually but little longer than broad; series of granules between the supraoculars and the superciliaries complete, or first superciliary in contact with the second supraocular; parietal in contact with the upper postocular*; 4 upper labials† anterior to the subocular, which is narrower beneath than above; masseteric shield present.‡

Scales finely granular, distinctly keeled, 61 to 76 across the middle of the body; 36 to 57 transverse series, in the middle of the back, correspond to the length of the head, 3 and 4 on the side correspond to a ventral plate. Ventral plates in 24 to 27 transverse series in males, 30 to 32 in females.§ Preanal shield moderately large, bordered by one or two semicircles of small shields.

Scales on upper surface of tibia a little smaller than dorsals. 13 to 19 femoral pores on each side.‖ 23 to 28 lamellar scales under the fourth toe.

Caudal scales rather oblique, forming subequal whorls or alternately

* Except in one specimen from Tangier.

† 5 on one side in a specimen from Tangier, 3 on one side in another and in one from Algarve.

‡ Except in one specimen from Tangier; divided into 2 or 3 pieces in the specimen from Algarve.

§ 8 longitudinal series, the outer plate being divided, in the specimen from Algarve.

‖ Up to 20 according to Boettger.

longer and shorter, upper moderately or strongly keeled, truncate or very obtusely pointed behind; 25 to 35 scales in the fourth or fifth whorl.

Olive-grey above, with small black spots or reticulations; a more or less defined dark lateral band, bordered above by a whitish streak or series of white spots; no dark vertebral streak or series of spots; limbs with round light, dark-edged spots; upper surface of head more or less spotted or marbled with black; two series of white, black-edged spots along each side of the tail. Belly white or pale orange, uniform or with a few scattered black dots; throat with black dots.

Measurements (in millimetres):

	Tangier. ♂	Tangier. ♀	Salir. ♂
From end of snout to vent	52	50	47
„ „ „ fore limb	21	19	19
Length of head	13	10	12
Width of head	9	7	8
Depth of head	6	5	6
Fore limb	19	15	16
Hind limb	30	24	26
Foot	16	13	15
Tail	98	83	—

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Tangier	52	68	26	10	30	18–19	23
„ „	49	70	24	10	25	17–18	23
♀ „	51	61	30	9	26	18–17	25
„ „	51	67	32	11	29	18–17	26
„ „	50	73	30	10	24	13–15	25
„ „	50	68	30	10	28	15–16	24
♂ Salir, Algarve	47	76	27	10	31	18–17	28

Columns as on p. 175.

Var. BOCAGII.

Lacerta muralis, Strauch, Erp. Alg. p. 33 (1862); Boettg. Sitzb. Ak. Berl. 1887, p. 185; Bedriaga, Amph. Rept. Portug. p. 52 (1890); Doumergue, Erp. Oran. p. 123 (1901); Bouleng. Nov. Zool. 1905, p. 75, pl. ii.

Lacerta muralis, var. *bocagii*, Seoane, Idend. de Lacerta Schreiberi, p. 18 (1885); Bouleng. Tr. Zool. Soc. xvii, 1905, pp. 361, 415, pls.

xxiv, figs. 6–8, and pl. xxix, fig. 10, and xx, 1913, p. 144, pl. xvi, figs. 11, 12; Schreib. Herp. Eur., ed. 2, p. 424 (1912).

Lacerta muralis, var. *fusca*, Doumergue, op. cit. p. 125, pl. viii, fig. 8.

? *Lacerta muralis guadarriana*, Boscá, Bol. Soc. Espan. H.N. xvi, 1916, p. 328.

The head is either similar to that of the typical *L. muralis*, or more depressed, sometimes as much as in the vars. *bedriagæ* and *chalybdea*; its depth equals the distance between the centre or the posterior border of the eye and the tympanum. The hind limb reaches the axil, the shoulder, or the collar in males, the wrist, the elbow, or the axil in females; foot a little longer than the head. Tail $1\frac{1}{2}$ to a little over 2 times the length of head and body.

Rostral not touching the nostril*; frontonasal sometimes in contact with the frontal†; frontal as long as or a little shorter than its distance from the end of the snout; parietals $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad; occipital usually broader than the interparietal‡; series of granules between the supraoculars and the superciliaries complete or incomplete; suture between the first and second superciliaries usually oblique, but not rarely vertical; usually 4 upper labials§ anterior to the subocular, which is usually much narrower beneath than above; temporal scales small; masseteric shield sometimes large, often small or absent; upper temporal shields often broken up, the first sometimes in contact with the fourth supraocular.||

22 to 35 scales between the symphysis of the chin-shields and the median collar-plate, usually 23 to 30; gular fold distinct; collar even-edged, the plates often small, 7 to 12, usually 9 to 11.

Scales granular, round or oval-subhexagonal, smooth or feebly keeled, 50 to 67 across the middle of the body, usually 54 to 65; 36 (♂) to 60 (♀) transverse series in the middle of the back correspond to the length of the head, 3 and 4 on the side correspond to a ventral plate. Ventral plates 25 to 29 transverse series in males,

* In contact with the frontonasal in 5 specimens (Ciudad Real, Burbia, Cacabelos and Villa Franca).

† In 10 specimens (Galicia, Sisargas Id., Cacabelos, Villa Franca).

‡ Sometimes twice as broad. Absent in a specimen from Coimbra. Sometimes fused with the interparietal or separated from it by a small shield.

§ 5 on both sides in two specimens from Coimbra, in one from Tlemsen, and in one from Tunisia; on one side in 8 specimens (Sisargas Id., Serra de Gerez, Tamaruth Valley, Fenzou); 3 on one side in specimens from Tamaruth Valley.

|| In 21 specimens: Tamaruth Valley (9), Fenzou (3), Cacabelos (3), Serra de Gerez (2), Burbia, Villa Franca, Coimbra, Sersou.

28 to 32 in females.* Preanal plate usually rather large,† bordered by one, rarely by two, semicircles of smaller plates.

Scales on upper surface of tibia a little smaller than dorsals. 14 to 22 femoral pores on each side,‡ usually 16 to 19. 20 to 29 lamellar scales under the fourth toe, usually 22 to 26.

Caudal scales more or less oblique, truncate or very obtusely pointed behind, forming alternately longer and shorter whorls, the upper usually more or less strongly keeled, rarely feebly keeled; 26 to 34 scales in the fourth or fifth whorl behind the postanal granules.

Coloration and markings very variable, but a vertebral streak or series of spots constantly absent on the body, though sometimes represented on the nape. The var. *bocagii* was founded on the green colour of the back in specimens from Galicia, which is also found in Algerian specimens ("variété verte" of Doumergue); but the upper parts are more often grey, brown, or olive. Females usually bear two whitish streaks on each side, the upper proceeding from the superciliary edge, the lower passing through the ear, separated by a dark brown band sometimes bearing white, black-edged ocelli, or by crowded black spots; the dorsal space between the light streaks is at least as great on the body as on the nape in Moroccan and Algerian specimens, but it is often narrower on the body in Spanish and Portuguese; brown or black spots are often present on the back, but they are irregularly disposed or form two longitudinal series, sometimes in the form of rings; upper surface of head uniform, or with black spots. Some females are handsomely marked with four broad black stripes separated by the white dorsolateral lines. Males are sometimes marked like the females, but the black spots often transform into a reticulation, and the whole of the body may show a black network enclosing small roundish pale green spots, such specimens (from the Serra de Gerez) being very suggestive of the var. *bedriagæ*, which they also approach in the very flat head and body. Others are not without a general resemblance to the var. *pityusensis*, except for the absence of a vertebral stripe or series of spots, and have no doubt given rise to Bedriaga's remarks § on Galician specimens being a connecting form between that variety and the typical *L. muralis*. The upper surface of the head is usually much spotted with black. Black and white

* 8 longitudinal series in 2 specimens from Tamaruth Valley and in one from Fenzou. An incomplete outer series is sometimes present.

† Small in a female from Tlemsen, bordered behind by a series of granules.

‡ An additional series of smaller pores in a male from Coimbra.

§ Abh. Senck. Ges. xiv, 1886, p. 255.

spots or bars often present on the sides of the tail, sometimes connected by narrow bars across the upper surface.

The lower parts are white, uniform or but scantily spotted with black * ; blue spots usually present on the outer ventral plates.

Measurements (in millimetres) :

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11
From end of snout to vent	57	55	57	55	55	48	46	51	46	52	56
„ „ „ fore limb	22	19	23	21	21	18	17	20	17	21	21
Length of head . . .	14	12	14	14	13	11	10	13	10	14	12
Width of head . . .	10	8	10	9	9	8	7	8	7	9	8
Depth of head . . .	8	7	5·5	7	6	6·5	5·5	6	5	7	6
Fore limb	20	17	20	20	18	16	14	18	15	20	17
Hind limb	30	24	31	30	27	20	21	27	22	30	26
Foot	16	15	16	17	15	15	13	15	13	17	14
Tail	85	92	—	103	93	102	—	89	83	95	—

1. ♂, 2. ♀, Galicia. 3. ♂, Cacabelos. 4. ♂, 5. ♂, Serra de Gerez. 6. ♂, 7. ♀, Lisbon. 8. ♂, 9. ♀, Tamaruth Valley. 10. ♂, 11. ♀, Tlemsen.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
Spain :							
♂ Galicia.	57	60	29	9	29	16–15	23
„ „	52	59	26	12	27	16	23
„ „	45	54	27	11	23	18–17	27
„ „	42	55	27	10	24	16–15	21
♀ „	60	57	29	8	25	16	22
„ „	56	54	28	11	23	18–17	?
„ „	55	62	30	10	27	17	22
„ „	52	59	30	9	26	16–17	24
„ „	49	54	29	10	24	16–15	23
♂ Corunna, **P.M.** . . .	63	56	25	9	26	16	24
„ „ „ . . .	58	65	26	11	27	16	22
♀ „	44	58	32	11	25	15	23
♂ Sisargas Id.	63	60	27	9	27	19	23
„ „	63	54	28	11	24	17–16	22
„ „	57	57	26	11	25	16–15	?
♀ „	59	59	31	11	25	18–19	20
♂ Cacabelos	57	54	27	7	23	14–15	25
„ „	55	52	26	8	28	16	24
„ „	55	55	27	11	29	15–16	22

* More profusely in a male from Corunna in the Paris Museum, and in one from Sisargas Id.

	1.	2.	3.	4.	5.	6	7.
♂ Cacabelos	55	51	27	10	26	17–16	24
„ „	54	50	28	9	31	16–17	24
„ Sierra de Pico, Burbia	64	60	27	10	28	16	24
„ „ „	48	53	27	11	22	17	23
♀ „ „	57	54	30	9	30	16–18	24
♂ Ariadapedra, Burbia	56	61	28	8	30	17	25
„ „ „	51	55	28	11	28	16	26
„ Villa Franca „	54	64	26	10	35	18–17	26
„ „ „	51	59	28	9	27	15	24
„ Escorial, Madrid	56	65	26	11	30	19	?
„ „ „	56	62	27	11	27	19–20	26
♀ „ „	59	56	29	10	29	17–16	24
♂ Lozoya Valley, nr. Madrid	65	59	29	9	28	17–18	26
„ „ „	63	60	28	10	25	18–17	23
„ „ „	61	55	26	10	23	16	25
„ „ „	60	62	26	10	27	18	27
„ „ „	57	61	27	10	26	19	26
„ „ „	53	65	28	11	27	19–18	26
♀ „ „	61	58	31	11	25	17–16	27
„ „ „	55	62	31	9	26	17–16	25
♂ Ciudad Real	57	53	25	10	29	17	27
♀ Los Morismos, Andalucia	47	58	28	10	26	20	29
PORTUGAL :							
♀ Oporto	58	60	31	8	28	17–18	23
♂ Coimbra	60	67	29	13	28	18–19	26
„ „	54	65	27	11	31	17–18	23
„ „	54	61	25	11	26	19–17	24
„ Lisbon	48	60	26	9	29	21	28
♀ „	48	60	30	9	23	16–18	26
„ „	46	55	30	10	29	19–18	26
♂ Serra de Gerez	55	58	26	9	26	17	26
„ „	55	54	26	9	28	19 18	23
„ „	55	57	28	11	26	17	23
„ „	55	63	28	9	31	15	23
„ „	53	55	26	10	29	19	23
♀ „	58	53	32	10	22	16	24
MOROCCO :							
♂ Tamaruth Valley	52	57	28	9	29	18–19	22
„ „	51	58	25	9	29	20–21	25
„ „	51	61	27	10	26	17–18	26
„ „	50	55	27	8	24	19–18	25

	1.	2.	3.	4.	5.	6.	7.
♂ Tamaruth Valley . . .	50	59	27	10	27	20	24
„ „ . . .	50	65	26	10	30	20–19	26
♀ „ . . .	52	64	31	8	30	20–21	25
„ „ . . .	50	58	30	8	26	17	24
„ „ . . .	48	55	29	9	28	18	23
„ „ . . .	47	55	28	8	27	19–17	22
„ „ . . .	46	57	30	9	25	16	22
„ „ . . .	45	56	32	10	28	17	23
♂ Fenzou	54	57	27	10	25	19–18	25
„ „	53	55	27	11	27	19	23
„ „	51	58	27	9	27	18–19	24
„ „	51	60	26	10	29	17–18	25
„ „	51	59	26	9	25	17	25
♀ „	55	59	30	10	29	18–19	23
„ „	53	51	29	9	25	18	24
„ „	52	58	29	7	25	19	25
„ „	50	50	29	8	22	16	24
„ „	49	55	31	7	30	18	24
ALGERIA :							
♂ Tlemsen	56	56	25	11	24	18–17	25
„ „	54	61	27	8	27	18	24
„ „	52	65	27	10	29	21	25
„ „ . . .	48	60	25	10	27	19–18	24
♀ „	56	57	30	9	27	19	22
„ „	56	55	30	11	26	18–19	24
„ „	48	58	28	11	26	20	21
„ Mascara	51	61	29	9	25	17	?
♂ Sersou	46	61	25	10	27	19–21	23
♀ „	48	60	28	9	24	16–17	24
„ Aumale	57	57	30	12	26	17–16	25
„ „	50	65	30	11	27	17–18	23
♂ Setif	56	59	27	11	26	18–19	26
„ „	47	65	28	11	27	20–22	24
♀ Tebesa	42	56	30	11	26	17	25
TUNISIA :							
♀ Tunisia, **P.M.** . . .	58	57	29	10	26	16–18	24

Columns as on p. 175.

Habitat.—Western, Central and Southern Spain; Portugal; Atlas of Morocco; High Plateaux and Tell of Algeria; North-Western Tunisia. Reaches an altitude of at least 1000 metres in Spain, 1500 metres in the Atlas of Morocco.

Var. MONTICOLA.

Lacerta muralis, var. *monticola*, Bouleng. Tr. Zool. Soc. xvii, 1905, p. 365, pl. xxiv, figs. 11–13, and pl. xxv, figs. 11–13, and xx, 1913, p. 145, pl. xvi, fig. 14.

Lacerta monticola, Schreib. Herp. Eur., ed. 2, p. 409 (1912).

A mountain form completely connected with and evidently derived from the preceding, and so closely resembling the Caucasian forms *chalybdea* and *saxicola* that it would be identified with them were it not for the remote habitat. I regard this resemblance as an interesting case of parallelism which throws light on the question of the rank to be assigned to other forms allied to *L. muralis*. The var. *monticola* has also much in common with the var. *horvathi*, from which it differs principally in the absence of a dark vertebral streak.

The head is strongly depressed, and the upper temporals are well visible from above; snout very obtuse. The hind limb reaches the wrist or the elbow of the adpressed fore limb (females); the foot is slightly shorter than the head. Tail $1\frac{3}{4}$ times as long as head and body.

The rostral does not touch the nostril and forms a suture with the frontonasal; in one specimen the nasal forms a suture with the anterior loreal above the postnasal; frontal as long as or a little shorter than its distance from the end of the snout; series of granules between the supraoculars and the superciliaries usually complete*; 6 or 7 superciliaries, suture between the first and second vertical; parietals $1\frac{1}{2}$ times as long as broad, antero-lateral border sometimes concave; occipital shorter and a little broader than the interparietal; subocular not or but slightly narrower beneath than above; masseteric shield usually large†; two or three large upper temporals, the first sometimes in contact with the fourth supraocular.

22 to 26 scales in a longitudinal series between the symphysis of the chin-shields and the median collar-plate; gular fold feebly marked. Collar even-edged, composed of 8 to 10 plates.

Dorsal scales large and flat, smooth, or feebly keeled on the posterior part of the back, larger than those on the sides, which are larger than those on the upper surface of the tibia; 46 to 52 scales across the middle of the body, 27 to 34 transverse series corresponding to the length of the head, 3 or 4 on the side corresponding to a ventral plate. 28 or 29 transverse series of ventral plates, some of which may

* Incomplete in a specimen from Burbia.

† Absent in a specimen from Burbia.

contain 8 plates. Preanal plate rather large, bordered by one semicircle of small plates.

14 to 20 femoral pores on each side. 23 to 26 lamellar scales under the fourth toe.

Caudal scales in very markedly longer and shorter whorls alternately, upper truncate and very feebly keeled; 28 to 30 scales in the fourth whorl.

Greyish or pale olive above (in spirit), usually with large black spots forming two series close together along the middle of the back*; sides darker, bordered above by a series of black spots or by a black wavy streak enclosing round light spots; a few dark ocelli with light centres may be present above the shoulder and axil; tail with black and white spots on the sides. Lower parts whitish or greyish, with or without scattered black dots on the belly and under the hind limbs.

Measurements (in millimetres).—Females :

From end of snout to vent	76	62	62
,, ,, ,, fore limb	27	22	24
Length of head	16	15	15
Width of head	11	10	10
Depth of head	7	6	7
Fore limb	22	20	21
Hind limb	35	31	31
Foot	17	17	17

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7
♀ Spain (type)	76	50	28	10	25	18–17	23
,, Galicia ,,	62	46	28	9	22	17	24
,, Burbia ,,	70	52	29	8	26	15–14	23
,, ,,	64	50	28	9	23	18–17	26
,, Serra Estrella (type)	62	47	29	9	25	19–20	23

Columns as on p. 175.

Habitat.—This variety is known from Galicia, from Burbia in the Province Leon (altitude about 1500 metres), and from the Serra Estrella in Portugal (altitude about 1800 metres).

* A pattern foreshadowed by Spanish specimens of the var. *bocagii*, in which the dorsolateral series of black spots approach each other on the back, though not to the same extent.

Group V.—Europe east of the Adriatic, Caucasus, Asia Minor, Persia.

The forms included under this head are, like those of the parallel Western Group IV, more nearly related to the typical *L. muralis*, and some of them show considerable resemblance to the species of the *Zootoca* Section. A dark vertebral streak or series of spots is primarily present in the first two varieties, as in the typical form, whilst it has been lost in the others. The last five varieties so completely merge into one another that the definitions are necessarily somewhat vague and unsatisfactory; they constitute the *L. saxicola* of Méhely. The vars. *chalybdea* and *saxicola* closely approach the var. *monticola* in the preceding group. The prevailing colour is brown, but green specimens are known of the vars. *chalybdea* and *saxicola*.

Var. *breviceps*, Blgr.—Head not strongly depressed; hind limb reaching axil or shoulder in males; scales rhombic or hexagonal, strongly keeled, 45 to 55 across the body; femoral pores 13 to 16; 21 to 24 lamellar scales under the fourth toe; collar-edge more or less distinctly serrated; caudal scales more or less pointed behind. From snout to vent up to 55 millim.—Herzegovina.

Var. *horvathi*, Méhely.—Head much depressed; hind limb reaching axil or shoulder in males; scales roundish-hexagonal or oval, smooth or faintly keeled, 39 to 49 across the body; femoral pores 16 to 23; 26 to 28 lamellar scales under the fourth toe; series of granules between the supraoculars and the superciliaries usually complete; rostral forming a suture with the frontonasal. From snout to vent up to 65 millim.—Mountains of S.W. Croatia.

Var. *caucasica*, Méhely.—Head not strongly depressed; hind limb reaching shoulder or collar in males; scales smooth or faintly keeled, 40 to 50 across the body; femoral pores 12 to 17; 25 to 29 lamellar scales under the fourth toe; collar-edge more or less distinctly serrated. From snout to vent up to 60 millim.—Caucasus.

Var. *chalybdea*, Eichw.—Head much depressed; hind limb reaching elbow or axil in males; foot not or but slightly longer than head; granules between the supraoculars and the superciliaries often in an incomplete series, sometimes reduced to 3; dorsal scales smooth or faintly keeled, larger than tibials, 40 to 55 across the body; femoral pores usually less than 20; 24 to 29 lamellar scales under the fourth toe. From snout to vent up to 75 millim.—Transcaucasia, Asia Minor, Mesopotamia.

Var. *saxicola*, Eversm.—Head much depressed; hind limb longer, foot longer than head; granules between supraoculars and superciliaries forming a complete series; dorsal scales smooth or feebly keeled, not larger than tibials, 50 to 65 across the body; femoral pores 16 to 22; 25 to 31 lamellar scales under the fourth toe. From snout to vent up to 80 millim.—Crimea, Cis- and Transcaucasia, Asia Minor.

Var. *portschinskii*, Kessl.—Like the two preceding, but smaller and more slender, with more pointed snout. Dorsal scales smooth, as large as or larger than tibials, 51 to 56 across the body; 26 to 31 gular scales; femoral pores 16 to 21. Not known to exceed 57 millim. from snout to vent.—Transcaucasia.

Var. *defilippii*, Camer.—Proportions more as in the preceding. Dorsal scales smooth, as large as or larger than tibials, 46 to 53 across the body; caudal scales usually feebly keeled; 22 to 25 gular scales; femoral pores 14 to 20. Size as in the preceding.—Transcaucasia and Northern Persia.

Var. *rudis*, Bedr.—Head much depressed; hind limb reaching shoulder or collar in males; dorsal scales more or less distinctly keeled, 45 to 58 across the body; tibial scales much larger, strongly keeled; caudal scales almost spinose on the sides; 25 to 34 gular scales; femoral pores 15 to 23. From snout to vent up to 87 millim.—Transcaucasia.

Var. BREVICEPS.

Lacerta muralis, var. *breviceps*, Bouleng. Ann. Mus. Zool. Nap. i, 1905, no. 29, and Tr. Zool. Soc. xvii, 1905, p. 378, pl. xxv, figs. 16–18, and xx, 1913, p. 164.

In general appearance intermediate between *L. muralis* and *L. vivipara*.

Head small and convex, $1\frac{1}{3}$ to $1\frac{2}{5}$ times as long as broad, its depth equal to the distance between the anterior corner of the eye and the tympanum; snout obtusely pointed. Neck as broad as the head, or little narrower. Body rather strongly depressed. Hind limb reaching the elbow, the axil, or the shoulder in males, the wrist or the elbow of the adpressed fore limb in females; foot not or but slightly longer than the head. Tail $1\frac{3}{4}$ to nearly 2 times the length of head and body.

Head-shields as in the typical form but frontal rather broader; nasal forming a short suture with its fellow and, in two out of eight specimens, in contact on one side with the anterior loreal; granules between the supraoculars and the superciliaries reduced to 3 to 10;

parietals not or but little longer than broad; occipital smaller than the interparietal, entirely absent in one specimen; temporal scales usually rather large, with large masseteric shield.

Gular scales rather large, 19 to 25 in a longitudinal series; gular fold rather feebly marked. Collar feebly or very feebly serrated, with 8 to 10 plates.

Scales large and flat, round, roundish-hexagonal, or distinctly hexagonal, more distinctly keeled than usual in the typical form, 45 to 55 across the middle of the body; 24 to 36 transverse series, in the middle of the back, correspond to the length of the head, 3, or 2 and 3, on the side correspond to a ventral plate. Ventral plates in 23 to 28 transverse series. Preanal plate large, with one semicircle of small plates. Scales on upper surface of tibia keeled and much smaller than dorsals. 13 to 16 femoral pores on each side. 21 to 24 lamellar scales under the fourth toe.

Upper caudal scales strongly or moderately keeled, very oblique, more or less distinctly pointed behind, the whorls often very distinctly longer and shorter alternately; 25 or 26 scales in the fourth whorl.

Brown above, with a darker lateral band, light-edged above and beneath, and a dark vertebral streak or series of spots, exactly as in some specimens of the typical *L. muralis* and of *L. vivipara*. Throat and breast spotted with black; the belly of the males may be studded with thick black dots.

Measurements (in millimetres):

	♂.		♀.	
From end of snout to vent . .	64	51	62	56
„ „ „ fore limb .	21	22	21	20
Length of head	14	13	14	12
Width of head	8·5	9·5	8·5	9
Depth of head	7	7	7	7
Fore limb	19	18	18	18
Hind limb	28	27	27	26
Foot	15	15	14	14
Tail	—	97	—	104

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Type (Naples Mus.) . .	51	55	25	9	21	15–16	
„ „	41	48	23	9	21	16–15	
♀ „ (Naples Mus.) . .	56	46	27	8	20	14–16	22–24
.. ..	56	48	28	8	25	16	
.. ..	55	51	27	10	20	16	

	1.	2.	3.	4.	5.	6.	7.
♂ Babaplanina . . .	64	45	28	8	22	15	22
♀ „ . . .	62	48	29	9	22	16	23
„ „ . . .	47	45	28	8	19	13–14	21

Columns as on p. 175.

The type specimens were labelled "Neapolitano" in the Naples University Museum, but this indication is probably erroneous as, on looking through the large collection of Italian lizards in the Florence Museum, I failed to find any that could be referred to this variety, the certain habitat of which is Herzegovina, at an altitude of 1300 to 1400 metres.

In its short and convex head, in its feebly serrated collar, in its pointed caudal scales, as well as in its larger temporal scales, the var. *breviceps* not only approaches *L. vivipara*, but also fills up to some extent the gap separating the typical *L. muralis* from the var. *fiumana*.

Var. HORVATHI.

Lacerta mosorensis, part., Méhely, Allantani Köslem. ii, 1903, p. 212.

Lacerta horvathi, Méhely, Ann. Mus. Hung. ii, 1904, p. 362, figs., Allantani Köslem. iii, 1904, p. 193, pl. v, Ann. Mus. Hung. iii, 1905, p. 298, and vii, 1909, p. 600, pl. xxiv, figs. 1–4, and xxv, figs. 5–8.

Lacerta muralis, var. *horvathi*, Boulenq. Tr. Zool. Soc. xx, 1913, p. 165, pl. xx, figs. 1, 2.

Habit rather stout and depressed. Head much flattened, with short, obtuse snout. The hind limb, stretched forwards, reaches the axil or the shoulder in the male, the wrist or the elbow of the adpressed fore limb in the female; foot as long as or a little longer than the head.

The rostral does not touch the nostril, and forms a suture with the frontonasal; frontal short, usually as long as its distance from the rostral, sometimes as long as its distance from the end of the snout; a series of granules between the supraoculars and the superciliaries, sometimes complete, rarely reduced to 5, the first and second superciliaries being in contact with the supraocular; parietal more or less distinctly emarginate on the outer border, where it forms a suture with a large anterior upper temporal, and usually in contact with the upper postocular; occipital usually shorter and narrower than the interparietal, sometimes extremely small. Anterior nasal often in contact with the anterior loreal; four anterior upper labials (rarely five or three); temporal scales rather large, with a distinct masseteric shield, which is sometimes in contact with the last or penultimate upper labial.

Dorsal scales large, flattened, roundish-hexagonal or oval, smooth or faintly keeled, rather smaller on the sides, where 3 or 4 correspond to a ventral shield; 39 to 49 (usually 42 to 46) scales across the middle of the body; 22 to 31 scales, in the middle of the back, correspond to the length of the head. 23 to 27 gular scales in a longitudinal series; collar straight-edged, with 8 to 11 plates. Ventral plates in 23 to 27 transverse series (23–25 in ♂, 25–27 in ♀). Preanal large, with a single semicircle of small shields. Scales on upper surface of tibia more or less distinctly keeled, considerably smaller than dorsals. 16 to 23 femoral pores (usually 16 to 18) on each side. 26 to 28 lamellæ under the fourth toe. Caudal scales truncate behind, more or less strongly keeled, often feebly keeled at the base of the tail, in alternately longer and shorter whorls.

Coloration of upper parts much as in *L. muralis typica*, sometimes with greenish gloss.* A vertebral series of dark dots is often present, sometimes forming a vertebral streak; lower parts pale yellow, sometimes washed with greenish, with or without small black or rust-coloured spots on the sides of the belly, which are always devoid of blue spots.† For fuller particulars of the coloration I refer to Méhely's detailed description, from which I have drawn an account of the variations in the lepidosis. The following is a tabulation of the numerical characters in the specimens examined by me.

	1.	2.	3.	4.	5.	6.	7.
♂ Jasenak (type) . . .	60	43	25	10	26	17	28
♀ „	64	41	27	9	24	18–17	26
„ „	59	45	26	8	25	17	26
„ Kapela	57	49	26	10	25	17	27

Columns as on p. 175.

Measurements (in millimetres) ‡:

	♂.	♀.
From end of snout to vent . . .	60	64
„ „ „ fore limb . .	23	24
Length of head.	15	14
Width of head	10	9
Depth of head	7	6·5

* Which may also be observed in some typical *L. muralis*. *Cf.* Kammerer, Arch. Entwicklmech. xxix, 1910, p. 462.

† As in some Caucasian specimens (var. *chalybdea*) on which Méhely has founded his var. *armeniaca*. These blue spots are also absent in many females of other varieties, and, though rarely, in some males also.

‡ If compared with the measurements of Bosnian specimens (above, p. 169), it will be seen that there is no justification for Méhely's statement (1909, p. 600), "Gliedmassen etwas kürzer," than in *L. muralis*.

	♂.	♀.
Fore limb	23	21
Hind limb	34	32
Foot	18	17
Tail	?	115

Habitat.—This lizard is only known from S.W. Croatia (Kapela and Velebit ranges), where it inhabits wooded districts between 600 and 1100 metres altitude, often in company with the typical form of *L. muralis* and *L. vivipara*.

It bears some resemblance to *L. mosorensis*; in his original description (1904) Méhely regarded it as directly derived from that species (pp. 374 and 375), and in a somewhat later contribution (1905, p. 315) is very positive about it.*

Var. CAUCASICA.

Lacerta muralis, var. *saxicola* (non Eversm.), Kessler, Tr. Soc. Nat. St. Pétersb. viii, 1878, p. 152.

Lacerta muralis, var. *fusca*, f. *praticola*, part., Boettg. Ber. Offenb. Ver. Nat. 1880, p. 91.

Lacerta saxicola, subsp. *gracilis*, Méhely, Ann. Mus. Hung. viii, 1909, p. 555.

Lacerta caucasica, Méhely, t.c. p. 560, pl. xxi, figs. 1 and 2;

* "So ist *Lacerta horvathi* nachweisbar der Abkömmling der dalmatinisch-hercegowinischen *Lacerta mosorensis*." At that time (1905), I pointed out (pp. 365–367, figs.) the agreement in many respects of *L. horvathi* with the Spanish-Portuguese var. *monticola* and the Asiatic vars. *saxicola, chalybdea*, and *depressa*. In Méhely's latest account (1909, p. 614), nothing more is said of the derivation of *L. horvathi* from *L. mosorensis*, but the former is held to be descended from *L. saxicola typica*: "Demgemäss kann *L. horvathi*, trotz ihrem scheinbar primitiveren Schädelbau sehr wohl von *L. saxicola* typ. abgeleitet werden, mit welcher Art sie auch durch unverkennbare Beziehungen des Schuppenkleides und des Schädelbaues auf das innigste verbunden ist. *L. horvathi* steht in jeder Beziehung auch zu *L. saxicola armeniaca* so nahe, dass sie eventuell für eine etwas veränderte Form derselbem betrachtet werden könnte, dennoch können diese beiden Formen miteinander naturgemäss nicht verbunden werden und müssen für parallele Entwickelungsformen gelten, die beide aus *L. saxicola* typ. hervorgegangen und vielleicht in ähnlich beschaffenen Gegenden, zufolge der Einwirkung ähnlicher klimatischer Verhältnisse oder einer ähnlichen Lebensweise zustande gekommen sind." Except for the derivation from *L. saxicola* I entirely agree with the above statement, and in view of the state of things in the Spanish-Portuguese vars. *bocagii* and *monticola*, it is needless to say that I can only regard *L. horvathi* as one of the numerous forms or varieties of *L. muralis*.

Nikolsky, Ann. Mus. Zool. St. Pétersb. xv, 1910, p. 495; Lehrs, Festschr. R. Hertwig, ii, p. 234, pl. xiv, figs. 4–6 (1910); Nikolsky, Herp. Caucas. p. 82 (1913).

Lacerta muralis, var. *caucasica*, Bouleng. Tr. Zool. Soc. xx, 1913, p. 198, pl. xxiii, figs. 3–5.

This form, characterized by a distinctly serrated collar, large gular and dorsal scales, a low number of femoral pores, bears some resemblance to *L. derjugini*.

Shape of head and proportions exactly as in the typical form of *L. muralis*; hind limb reaching the shoulder or the collar in the male, the elbow of the adpressed fore limb in the female.

Rostral not touching the nostril, usually separated from the frontonasal*; nasal sometimes forming a suture with the anterior loreal†; granules between the supraoculars and the superciliaries forming a complete or incomplete series, or even reduced to three; occipital much shorter but sometimes broader than the interparietal; anterolateral notch of parietal present or absent‡; anterior supratemporal usually in contact with the fourth supraocular§; temporal scales granular,‖ tympanic shield large, masseteric large or moderate; three or four upper labials anterior to the subocular. Gular fold feeble or absent; edge of collar more or less distinctly serrated.¶

Dorsal scales round or oval-hexagonal, smooth or faintly keeled, 30 to 42 corresponding to the length of the head, 2 or 3 or 3 or 4 to one ventral plate. Preanal with one semicircle of small plates. Scales on upper surface of tibia feebly keeled, smaller than dorsals. Caudal scales forming alternately longer and shorter whorls, diagonal, more or less strongly keeled, truncate or obtusely pointed behind, 26 to 30 in the fourth whorl behind. Postanal granules.

Brownish or olive above, with paired series of blackish spots, which are crowded on a dark lateral band extending from the temple to the root of the tail; above and below this a light streak is usually present, the upper of great width in the specimen from Mt. Fatguss; lower parts white or greenish, in spirit; a series of small blue spots on the outer row of ventrals.

* Forming a narrow suture with the frontonasal in the specimen from Dariel Gorge.

† In one of the specimens from Mleti.

‡ In one of the specimens from Mleti.

§ Not so in the specimen from the Dariel Gorge.

‖ Rather large in the specimen from Armenia.

¶ Very feebly in one of the specimens from Mleti.

Measurements (in millimetres):

	♂ Mleti.	♂ Mt. Fatguss.	♀ Dariel Gorge.
From end of snout to vent . .	53	55	54
„ „ „ fore limb .	20	22	19
Length of head	14	14	13
Width of head	8	9	8
Depth of head	7	7	6
Fore limb	18	19	19
Hind limb	29	29	27
Foot	16	16	15
Tail	105	110	100

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Mleti	53	41	23	8	19	13–14	29
„ „	52	44	25	9	25	17–16	28
„ Armenia	53	40	25	8	19	15–14	26
„ Mt. Fatguss	55	46	24	8	23	17–18	27
„ „	50	47	24	9	20	15–16	25
♀ Dariel Gorge, **L.M.** . .	54	44	26	8	20	17–18	?

Columns as on p. 175.

In form, scaling, and coloration, this variety has much in common with the Spanish-Portuguese var. *bocagii*, the resemblance being particularly striking if the specimen from Mt. Fatguss be compared with some from the mountains of Portugal. I may add that a male from the Lozoya Valley, near Madrid, has the caudal scales more pointed than in one from Mleti.

A small male from Daghestan, Caucasus, received from the late Dr. Radde in 1904, appears to represent Méhely's var. *gracilis*.

Although the collar is not serrated and the caudal scales can hardly be called pointed, its resemblance to the specimen from Mt. Fatguss is so great that I feel loth to separate it from them, even as a variety, until a larger series of specimens demonstrates the constancy of the characters adduced in favour of the distinction.

	1.	2.	3.	4.	5.	6.	7.
♂ Daghestan	48	44	27	8	22	16–14	29

I could not have determined this lizard by means of Méhely's key, as the hind limb does not extend beyond the axil. I refer it to *L. saxicola gracilis*, Méhely, on account of the locality and of its

describer's statement that it very closely approaches *L. caucasica*, although placed in a different species. Better than any others, I think, the Caucasian lizards show the fallacy of the modern craze for multiplying species and subspecies.

Var. CHALYBDEA.

Lacerta chalybdea, Eichwald, Zool. Spec. iii, p. 188 (1831), and Reise Kasp. Meer. i, pt. 2, p. 745 (1837); Bouleng. P. Z. S. 1904, ii, p. 337.

Zootoca chalybdea, Eichwald, Faun. Casp.-Cauc. p. 73, pl. xi, figs. 1–3 (1841).

Nucras ? chalybdea, Gray, Cat. Liz. p. 34 (1845).

Lacerta muralis fusca, var. *saxicola*, part., Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 195.

Lacerta muralis, part., Derjugin, Ann. Mus. Zool. St. Pétersb. vi, 1901, p. 97; Nikolsky, Herp. Ross. p. 130 (1905).

Lacerta depressa (non Camer.), Werner, Sitzsb. Ak. Wien, cxi, i, 1902, p. 1086, pl. iii, figs. 9, 10.

Lacerta saxicola, subsp. *bithynica* et *armeniaca*, Méhely, Ann. Mus. Hung. vii, 1909, p. 537, pl. xxi, fig. 7, and p. 549, pl. xxi, fig. 8.

Lacerta saxicola armeniaca, Nikolsky, Herp. Caucas. p. 78 (1913).

Lacerta muralis, var. *chalybdea*, Bouleng. Tr. Zool. Soc. xx, 1913, p. 187, pl. xxii, figs. 1, 2.

Form rather stout, head and body much flattened; limbs short, the hind limb reaching the axil or the elbow of the adpressed fore limb in the male, the wrist or the elbow in the female; foot not or but slightly longer than the head. Head flat above, nearly once and a half as long as broad, its depth equalling the distance between the centre or the posterior border of the eye and the anterior border of the tympanum; snout obtusely pointed.

Rostral not entering the nostril; suture between the nasals very short, or* rostral forming a suture with the frontonasal; a single postnasal; frontal as long as its distance from the end of snout; series of granules between the supraoculars and the superciliaries usually incomplete (3 to 8)†; interparietal long and narrow, usually

* In 4 out of the 18 specimens examined.

† Complete in a male from Mesopotamia and in a male and two females from Van. In a female from Mesopotamia the suture between the first and second superciliaries is distinctly oblique.

narrower than the short occipital; parietal usually more or less distinctly emarginate on the side for the accommodation of a large supratemporal,* which is sometimes in contact with the fourth supraocular and sometimes not; temporal scales granular; masseteric disc usually very large, sometimes moderate or small, sometimes divided into two; tympanic shield large; four upper labials anterior to the subocular. †

21 to 29 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold usually feebly marked or indistinct; collar-edge entire or feebly serrated; 7 to 11 collar-plates.

Scales on body granular, flat, smooth, equal in size, 40 to 53 across the middle of the body, 25 to 31 corresponding to the length of the head, 3 or 2 and 3 to one ventral plate. Ventral plates in 6 longitudinal series and 27 to 30 transverse series ‡; the plates of the two median series narrower than the others or equal to the outer. Preanal large, bordered by one semicircle of smaller plates, often preceded by a transversely enlarged shield.

Scales on upper surface of tibia smaller than dorsals, smooth or feebly keeled. 15 to 20 femoral pores on each side. 24 to 29 lamellar scales under the fourth toe.

Caudal scales forming alternately longer and shorter whorls, the two median dorsal series more or less distinctly enlarged; scales truncate and diagonal, strongly keeled, especially on the sides, the outline of which is distinctly serrated, though not to the same extent as in the var. *rudis*; 18 to 26 scales in the fourth or fifth whorl behind the postanal granules.

Both sexes are alike in coloration. Back greyish-brown or olive-brown, usually separated from the darker brown sides by a series of round white spots, which may be black-edged and ocellar; head and back with small, irregular, often vermicular black spots; sides often with large light, black-edged ocellar spots. Uniform yellow or yellowish-white beneath, the outer row of ventrals blue, or with a series of blue spots, in both sexes. An account of the coloration of fresh specimens is given by Werner.

According to Werner, the male may reach a length of 204 millim., whilst the female does not exceed 175.

* Hardly at all in one of the Ielenovka specimens and in one from Van.

† 5 in one specimen from Ielenovka and in one from Van.

‡ 26 to 32 according to Werner.

Measurements (in millimetres) :

	Ielenovka.		Bithynian Olympus.	Mesopotamia.	
	♂.	♀.	♀.	♂.	♀.
From end of snout to vent	58	70	70	68	75
,, ,, ,, fore limb	22	22	22	23	25
Length of head	13	14	15	14	15
Width of head	9	9	10	9	10
Depth of head	6	6	6	6	6
Fore limb	21	21	20	21	22
Hind limb	30	30	29	31	30
Foot	15	16	15	16	16

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Ielenovka, L. Gokcha	58	45	28	8	23	15–17	26
♀ ,, ,,	70	45	30	9	25	16–15	27
,, ,, ,,	67	45	29	9	24	15–16	27
,, ,, ,,	66	44	30	10	22	15	26
,, ,, ,,	64	40	30	9	21	16–15	26
,, ,, ,,	60	44	30	10	22	16–15	27
,, Kavkaz, ,,	57	44	29	10	23	17–15	28
Hgr. ,, ,,	42	46	28	9	22	16–17	27
♂ Van, Kurdistan, **L.M.**	54	51	28	8	26	17–18	29
♀ ,, ,, ,,	70	52	29	9	27	18–19	29
,, ,, ,,	70	53	28	11	29	19–18	27
,, ,, ,, **L.M.**	67	48	29	11	28	19–20	26
,, ,, ,, ,,	65	42	28	9	24	16–15	27
♂ Mesopotamia ,,	68	49	29	10	27	19–20	28
,, ,,	66	44	29	9	23	15–16	28
♀ ,, **L.M.**	75	53	28	9	28	18–19	28
,, ,,	69	45	29	9	22	16–17	28
,, Bithynian Olympus	70	50	30	10	28	16–15	24
,, Taurida, **P.M.**	70	47	27	7	22	16–17	24

Columns as on p. 175.

As stated above, examples of this variety are referred by Méhely to two sub-species of *L. saxicola*, which are thus differentiated in the key on p. 492.

Limbs long, hind limb of male reaching shoulder or collar, of female wrist or middle of fore arm; 41–45 scales across middle of body, not larger towards the belly, 3 corresponding to one ventral plate; gular scales 20–23; 4 rows of small shields under the thigh; femoral pores 14–18 . . . . Subsp. *armeniaca.*

Limbs short, hind limb of male reaching only the elbow or the axil; 47–51 scales across middle of body, distinctly larger towards the belly, 2 or 3 corresponding to one ventral plate; gular scales 25–29; 5 or 6 rows of small shields under the thigh; femoral pores 16–19 . . . . . Subsp. *bithynica*.

The only male specimen from Ielenovka at my disposal (*L. armeniaca*, Méhely) could not be determined by means of this synopsis, as it falls in the second division as regards the length of the hind limb, and in the first as regards the number of dorsal and gular scales. There is nothing distinctive in the character of the scales near the belly, and although it is true the female from the Bithynian Olympus (*L. bithynica*, Méhely) differs from the specimens from Ielenovka in having 4 instead of 3 series of small shields between the large femoral shields and the pores * as well as a slightly greater number of dorsal and gular scales, the differences are too slight to justify the establishment of a variety, and besides they are found to break down if put to the test of larger series than Méhely had the privilege of examining. The same author mentions and figures a single specimen in which the first supraocular is in contact with the frontal. Such a case I have never met with either in this variety or in any of the oriental forms which I unite under *Lacerta muralis*, with the single exception of a specimen from Elisabethpol (var. *saxicola*) in which it is so on one side only.†

The var. *valentini*, Boettger, Ber. Senck. Ges. 1892, p. 145 (*L. saxicola*, subsp. *valentini*, Méhely, t. c. p. 543, pl. xxi, fig. 6), does not appear to be separable from the var. *chalybdea*. 42 to 48 scales across the body, 19 to 21 femoral pores. Back green, with black spots and vermiculations. From snout to vent 75 millim. Karabagh and Armenia.

The name, *Lacerta composita*, Méhely, Ann. Mus. Hung. vii, 1909, p. 564, has been suggested for specimens from the Thana Valley in Transcaucasia, provisionally referred to *L. caucasica*, which were suspected to be hybrids between that species and *L. saxicola*, var. *defilippii*.

I am indebted to M. Lantz for a male specimen from the Ban s-Tsklevi Valley, near Borjon, Govt. Tiflis, out of a dozen examined by him‡ which appears to me to agree with Méhely's *L. composita*, especially as regards the number of longitudinal series of ventral

* These series of scales vary from 3 to 5 in the Mesopotamian specimens.

† Yet Méhely (Ann. Mus. Hung. viii, 1910, p. 223), gives "Frontale . . . öfters an das erste Supraoculare anstossend" as one of the features characteristic of his *Archæolacertæ*.

‡ Like *L. derjugini*, but unlike the typical *L. saxicola*, this lizard occurs in damp situations with dense vegetation.

plates, 8 instead of 6. It further differs from the var. *saxicola* in having the upper tibial scales considerably smaller than the dorsals. In most respects it agrees with the var. *chalybdea*.

A complete series of granules between the supraoculars and the superciliaries; 4 upper labials on one side, 5 on the other. Dorsal scales faintly keeled. Green above, spotted with black, black on the sides with round whitish spots.

Measurements (in millimetres):

From end of snout to vent	59	Depth of head	5
„ „ „ fore limb	21	Fore limb	23
Length of head	15	Hind limb	31
Width of head	9	Foot	18

Particulars of the Specimen.

	1.	2.	3.	4.	5.	6.	7.
♂	59	55	24	8	25	19–18	27

In sending me the specimen, M. Lantz observed that it seemed to him to be referable to Méhely's *L. mixta*, a supposed hybrid between *L. derjugini* and *L. saxicola*; but it does not at all agree with the description,* the hind limb being shorter, the head more depressed, the dorsal scales and the femoral pores more numerous, and the ventral plates in 8 longitudinal series.

M. Lantz, however, informs me that the latter character is not constant, and that the femoral pores vary between 14 and 20. The green on the back is remarkably vivid in life. It is therefore possible that the names *composita* and *mixta* refer to the same form, which it seems difficult to define, and the separation of which from the var. *chalybdea* must be regarded as very doubtful.

Var. SAXICOLA.

Lacerta saxicola, Eversm. Nouv. Mém. Soc. Nat. Mosc. iii, 1834, p. 349, pl. xxx, fig. 1; Nikolsky, Ann. Mus. Zool. St. Pétersb. xv, 1910, p. 490; Lehrs, Festschr. R. Hertwig, ii, pl. xiv, fig. 8 (1910); Schreib. Herp. Eur., ed. 2, p. 392 (1912).

Lacerta grammica (non Licht.), Rathke, Mém. Sav. Etr. Ac. St. Pétersb. iii, 1837, p. 303.

Lacerta taurica, part., De Filippi, Arch. Zool. Anat. Fis. ii, 1863, p. 386.

Podarcis depressa, part., Camerano, Atti Acc. Tor. xiii, 1878, p. 539.

Lacerta muralis fusca, var. *saxicola*, part., Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 195.

* T.c., p. 581.

Lacerta depressa, var. *modesta*, Bedriaga, t.c. p. 272; Boulenq. Cat. Liz. iii, p. 34 (1887); Boettg. Ber. Senck. Ges. 1889, p. 204; Steind. Ann. Hofmus. Wien, xx, 1907, p. 308.

Lacerta muralis, Köppen, Beitr. Russ. R. (2), vi, p. 63 (1883).

Lacerta muralis, var. *depressa*, part., Boettg. Ber. Senck. Ges. 1892, p. 141; Méhely, in Zichy, Dritte Asiat. Forschungsr. ii, Zool. p. 54 (1901); Derjugin, Ann. Mus. Zool. St. Pétersb. vi, 1901, p. 97; Nikolsky, Herp. Ross. p. 136 (1905).

Lacerta muralis, var. *defilippi* (non Camer.), Boettg. t.c. p. 144.

Lacerta muralis, part., Nikolsky, op. cit. p. 130.

Lacerta muralis, var. *depressa*, Bouleng. Proc. Zool. Soc. 1904, ii, p. 333, pl. xxii, fig. *a*.

Lacerta saxicola, f. *typica*, Méhely, Ann. Mus. Hung. vii, 1909, p. 495, pl. xviii, figs. 4, 5, 6, 8; Nikolsky, Herp. Caucas. p. 67 (1913).

Lacerta saxicola, var. *defilippii*, part., Méhely, t.c. p. 519, pl. xviii, figs. 1–3; Nikolsky, op. cit. p. 72.

Lacerta caucasica, var. *tenuis*, Nikolsky, Ann. Mus. Zool. St. Pétersb. xv, 1910, p. 496.

Lacerta muralis, var. *saxicola*, Bouleng. Tr. Zool. Soc. xx, 1913, p. 190, pl. xxii, figs. 3, 4.

In form similar to the typical *L. muralis*, or rather to the var. *brueggemanni*, but head more depressed as a rule, its depth not exceeding the distance between the centre of the eye and the anterior border of the tympanum; snout as a rule more pointed than in var. *chalybdea* and less than in var. *portschinskii*. Hind limb reaching the shoulder or the collar in males, the axil, or the elbow of the adpressed fore limb in females; foot longer than the head.

Head-shields as in var. *chalybdea*, but rostral not rarely in contact with the frontonasal, granules between the supraoculars and the superciliaries nearly always forming a complete series, and masseteric disc often smaller*; the supratemporal is usually in contact with the fourth supraocular, but the degree of emargination of the antero-lateral border of the parietal is very variable, some specimens† not differing in this respect from a typical *L. muralis*; frequently five upper labials anterior to the subocular. 23 to 32‡ scales and granules between the chin-shields and the collar, which is not serrated and composed of 8 to 12 plates.

Scales on body granular, round or roundish-hexagonal, smooth or

* Absent in specimens from Rasano, Talysch, and Katar, Armenia; very large in male from Borjom.

† From Shuska and Erdschias Dagh.

‡ Exceptionally 37 according to Méhely.

feebly keeled on the posterior part of the back, 50 to 66* across the middle of the body, 34 to 51 corresponding to the length of the head, 3 or 4 to one ventral plate. Preanal bordered by one or two semicircles of smaller plates, sometimes preceded by a transversely enlarged plate.

Scales on upper surface of tibia as large as or a little larger than dorsals,† more or less strongly keeled. 16 to 22‡ femoral pores on each side. 25 to 31 lamellar scales under the fourth toe.

Caudal scales forming alternately longer and shorter whorls, the two median dorsal series more or less distinctly enlarged; these scales truncate and more or less diagonal, strongly keeled, the outline on the side more or less distinctly serrated, but far less than in var. *rudis*; 22 to 28 scales in the fourth or fifth whorl behind the postanal granules.

A female from the Belaja R. (affluent of Kuban R.) in Ciscaucasia agrees well with the diagnosis given by Eversmann (L. supra latitudine capitis prasina, nigro-maculata, lateribus brunnea, nigro-maculata, subtus margaritacea versus latera cærulescens, rostro acuto, capite depresso; cauda longissima, scutellis argute carinatis annulata), and also with the figure which accompanies his description. I have, therefore, no doubt as to the correctness of the identification.

A specimen from the South Coast of Crimea, received alive from Mr. A. Brauner, and which agrees in all essential points with the above, was grass-green above, blackish brown on the sides; head, limbs, and tail golden brown; turquoise-blue spots above the axil and on the outer ventral shields; pinkish white beneath.

Some specimens are green above, others are grey or brown, the variation in this respect being comparable to what obtains in *L. muralis* and its var. *brueggemanni* in some parts of Italy. The head and back are spotted, dotted, or vermiculate with dark brown or black, the larger spots, if arranged with any symmetry, forming two vertebral series, as in the vars. *bocagii* and *monticola*; the sides are often black, with blue or white round spots; larger round white spots usually form a series on each side of the back; some specimens reticulate with black, much as in var. *tiliguerta*. Lower parts white, bluish, or yellowish; blue and black spots on the outer row of ventral plates, at least in the males; the belly is much spotted with blackish in a large male from Trebizond in the Paris Museum.

* 49 to 67 according to Méhely.

† Much larger in a male from Borjom, Govt. Tiflis, which, as pointed out to me by M. Lantz, is a transition-form between this variety and the var. *rudis*; also in a male from Trebizond in the Paris Museum.

‡ 16 to 25 (usually 18 to 22) according to Méhely.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.	7.	8.
From end of snout to vent	75	68	66	63	56	60	61	68
„ „ „ fore limb	30	28	27	25	23	23	22	26
Length of head	18	17	17	16	15	14	13	16
Width of head	12	11	11	10	10	9	8	12
Depth of head	7·5	6	9	7	7	6	6	6
Fore limb	27	23	26	25	22	22	20	23
Hind limb	43	40	40	36	31	31	30	35
Foot	22	20	21	20	18	17	17	19

1. ♂, Trebizond (**P.M.**). 2. ♂, Trebizond (type of *L. depressa*, var. *modesta*). 3. ♂, Crimea. 4. ♂, Tativ, E. Karabagh. 5. ♂, Erdschias Dagh, Asia Minor. 6. ♀, Belaja R., Ciscaucasia. 7. ♀, Shuska, E. Karabagh (var. *defilippii*, Boettg. nec Camer.). 8. ♂, Borjom, Tiflis.

The largest specimens, ♂ and ♀, examined by Méhely, measure 79 and 80 millim. from snout to vent, tail 150.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♀ Taurida, **P.M.**	55	66	28	10	29	19–17	25
♂ Crimea	66	61	25	10	29	20	29
„ „	45	64	26	10	28	20	27
„ „ South Coast	66	63	25	10	32	20	27
„ Belaja R.	51	65	27	10	32	21–20	29
♀ „	60	60	28	11	27	19	28
♂ Shuska, E. Karabagh	62	62	27	9	25	20–19	30
♀ „ „	61	55	29	8	25	18	30
„ „ „	53	53	29	8	25	18	31
♂ Tativ, „	63	60	28	8	29	19–20	31
♀ „ „	45	58	29	9	25	18	30
♂ Borjom, Tiflis	68	52	25	9	26	19	25
♀ „	56	59	26	9	28	20	26
„ „	56	57	28	8	32	17–18	28
♂ Iasotshka, nr. Suchum	68	60	24	9	29	19–20	26
♀ Migri-Gerusi, Zangezur Distr.	48	54	30	9	25	18–19	29
„ Elizabethpol	65	50	29	9	24	16	29
„ „	60	52	29	10	24	17–16	26
„ „	52	54	28	10	23	17–18	27
♂ Rasano, Talysch, **B.C.**	64	55	28	9	28	18	28
„ „ „ „	61	56	27	10	24	18	28
„ Helenendorf „	62	52	28	8	27	20–22	31

		1.	2.	3.	4.	5.	6.	7.
♀	Katar, Armenia, **L.M.** . .	46	58	29	9	24	21–18	28
♂	Trebizond, **P.M.** . . .	75	59	24	10	26	17	27
,,	Trebizond ? (type of *L. depressa*), **T.M.** .	68	60	26	11	31	22–21	27
,,	Trebizond ? ,, ,, .	52	61	25	8	32	18	26
,,	Erdschias Dagh, Asia Minor .	56	52	24	12	25	19–17	25
,,	Cicilian Taurus . . .	67	57	28	11	30	19	27

Columns as on p. 175.

Habitat.—Crimea, Cis- and Transcaucasia, Asia Minor.

Lacerta caucasica, var. *tenuis*, Nikolsky, which was referred by me, with a query, to the synonymy of *L. chlorogaster*, belongs to this form according to M. Lantz, who has examined the type from Lenkoran.

The vars. *brauneri*, Méhely (Ann. Mus. Hung. vii, 1909, p. 509), and *raddei*, Boettger (Ber. Senck. Ges. 1892, p. 142), with which I am only acquainted through the descriptions, appear to connect this form with the var *defilippii*.

The small var. *parvula*, Lantz and Cyrén, Mitth. Kauk. Mus. vii, 1913, p. 163, figs., from Artvin, Transcaucasia, of which I have examined a photograph received from Mr. Lantz, may be regarded as intermediate between the vars. *saxicola* and *portschinskii*.

Var. PORTSCHINSKII.

Lacerta taurica, part., De Filippi, Arch. Zool. Anat. Fis. ii, 1863, p. 386.

Podarcis depressa, part., Camerano, Atti Acc. Tor. xiii, 1878, p. 539.

Lacerta portschinskii, Kessler, Tr. Soc. Nat. St. Pétersb. viii, 1878, p. 160, pl. i; Bedriaga, Arch. f. Nat. 1879, p. 308.

Lacerta muralis, var. *depressa*, part., Bedriaga, t.c. p. 312.

Lacerta muralis, var. *portschinskii*, Bouleng. P. Z. S. 1904, ii, p. 337, pl. xxii, fig. 6, and Tr. Zool. Soc. xx, 1913, p. 193, pl. xxiii, fig. 1.

Lacerta muralis, part., Nikolsky, Herp. Ross. p. 136 (1905).

Lacerta saxicola, var. *chalybdea* (non Eichw.), Méhely, Ann. Mus. Hung. vii, 1909, p. 513.

Lacerta saxicola, var. *portschinskii*, Nikolsky, Ann. Mus. Zool. St. Pétersb. xv, 1910, p. 493.

Lacerta saxicola portschinskii, Nikolsky, Herp. Caucas. p. 70 (1913).

A small, slender form, with very pointed snout. Hind limb reaching the shoulder or the collar in the male, between the wrist and the elbow in the female. Frontonasal as long as broad or a

little longer; granules between the supraoculars and superciliaries forming a complete series; masseteric disc moderate or small, or absent; 4 or 5 upper labials anterior to the subocular. Collar even-edged, composed of 7 to 10 small plates; 26 to 31 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate. Dorsal scales round and flat, perfectly smooth, 51 to 56 across middle of body, 3 or 4 corresponding to a ventral plate. Usually a transversely enlarged plate in front of the preanal.* Scales on upper surface of tibia as large as or smaller than dorsals, feebly keeled. 16 to 21 † femoral pores on each side. 28 or 29 lamellar scales under the fourth toe. Caudal scales strongly keeled.

Greyish or pale yellowish brown above, with small darker markings; a more or less distinct dorsolateral series of small light spots; lower parts white or yellowish, the outer row of ventrals with blue spots.

Does not exceed a length of 57 millim. from end of snout to vent.

This form, known from the neighbourhood of Tiflis and Elizabethpol, and of which a specimen from Armenia (Chantre) is preserved in the Paris Museum, agrees in most respects with the var. *saxicola*. Some of the characters given in the above description are taken from Méhely's, as I have only examined three specimens, the first of which is one of the types of *L. depressa*, preserved in the Turin Museum.

	1.	2.	3.	4.	5.	6.	7.
♀ Tiflis ? **T.M.** . .	53	54	29	10	31	17–18	26
„ Elizabethpol . .	53	56	30	8	27	18–17	29
„ Armenia, **P.M.** . .	50	52	31	8	29	20–21	27

Measurements (in millimetres):

	♂.	♀.
From end of snout to vent . . .	53	53
„ „ „ fore limb . .	18	19
Length of head	11	11
Width of head	7	7
Depth of head	4	5
Fore limb	16	18
Hind limb	24	25
Foot	14	15
Tail	?	112

Kessler gave the length of the type specimen as 46 millim. from

* This is absent in the specimen in the Paris Museum.

† 20 to 22 according to Kessler.

snout to vent, tail 101. He regarded the very long tail as distinctive of *L. portschinskii* compared with *L. muralis.*

Var. DEFILIPPII.

Lacerta muralis, De Filippi, Viagg. Pers. p. 354 (1865); Blanf. Zool. E. Pers. p. 361 (1876).

Podarcis defilippii, Camerano, Atti Ac. Tor. xiii, 1877, p. 90, pl. iii, figs. 1–3.

Podarcis depressa, part., Camerano, t.c. 1878, p. 539.

Lacerta muralis fusca, var. *persica,* Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 199.

Lacerta muralis, var. *defilippii,* Boettg. in Radde, Faun. Flor. S.W. Casp.-Geb. p. 44 (1886); Bouleng. Proc. Zool. Soc. 1904, ii, p. 337, and Tr. Zool. Soc. xx, 1913, p. 195, pl. xxiii, fig. 2.

Lacerta saxicola, var. *defilippii,* Méhely, Ann. Mus. Hung. vii, 1909, p. 519 (part.), and Zool. Anz. 1910, p. 592.

Lacerta saxicola defilippii, Nikolsky, Herp. Caucas. p. 72 (1913).

A small form barely separable from the two preceding. Head often somewhat less depressed, more as in *L. muralis* typica. Hind limb reaching the shoulder or the collar in males, the wrist or the elbow in females; foot considerably longer than the head. As may be seen from the table of measurements, the proportions are the same as in the typical *L. muralis* from Central Europe.

The rostral sometimes enters the nostril, but is always separated from the frontonasal*; the series of granules between the supraoculars and the superciliaries is complete; the masseteric disc may be large or small, but is often wholly absent; the anterior supratemporal is often in contact with the fourth supraocular and does not always encroach upon the outer border of the parietal; occipital usually shorter and broader, sometimes much broader, than the interparietal†; four upper labials anterior to the subocular. 22 to 25 scales and granules between the chin-shields and the collar, which is not serrated, and composed of 9 to 11 very small plates; gular fold very indistinct or absent.

Scales on body granular, round or oval, smooth, equal, 45 to 53 across the middle of the body, 32 to 46 corresponding to the length of the head, 3 or 4 to one ventral plate. Preanal plate bordered by one or two semicircles of smaller plates.

* One of the specimens collected by Blanford has two superposed postnasals on one side.

† Which may be divided into two, or fused with the occipital.

Scales on upper surface of tibia as large as or smaller than dorsals, feebly keeled. 14 to 20 femoral pores on each side. 24 to 29 lamellar scales under the fourth toe.

Caudal scales differing from those of the preceding varieties in being less strongly keeled, sometimes very feebly; 24 to 32 scales in the fourth or fifth whorl behind the postanal granules.

The coloration of fresh specimens is thus described by Blanford:—"Olive-grey on the back, finely spotted with black, rather darker on the sides, the under parts pale throughout in some individuals, in others (probably males) all the abdomen, breast, throat, and sometimes part of the lower labials, are brick-red, and when this colour is most intense there is a line of pale blue spots on the exterior edge of the outermost ventral scales." I may add that a dorsolateral series of small light spots is more or less distinct, and that light round spots are usually present on the darker sides.

Measurements (in millimetres):

	♂	♀	♂	♀
From end of snout to vent	57	56	52	50
„ „ „ fore limb	21	23	19	18
Length of head	14	14	12	11
Width of head	9	9	7.5	7
Depth of head	7	7	5·5	5·5
Fore limb	19	20	15	15
Hind limb	30	30	24	24
Foot	17	17	14	14

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Elburz Mts., N. of Teheran (Blanford)	57	49	27	10	23	14–15	29
„ Ditto (Blanford)	53	52	26	11	25	16–15	28
„ „ „	53	45	26	9	23	16–17	28
„ „ „	53	46	25	10	22	17–20	25
♀ „ „	52	52	28	10	23	17	28
„ „ „	50	49	29	11	25	15	24
„ „ „	45	51	26	10	24	16–18	28
♂ „ (Woosnam)	56	51	24	9	25	17	26
„ „ „	52	48	26	9	25	17–16	28
„ Persia (type of var. *persica*)	50	53	25	11	22	16–15	29
♀ Tiflis? (type of *L. depressa*)	53	48	28	10	25	16	26

Columns as on p. 175.

This variety inhabits the mountains of Northern Persia and Transcaucasia. Reaches an altitude of 2300 metres in the Elburz Mountains.

Var. RUDIS.

Podarcis depressa, part., Camerano, Atti Acc. Torin. xiii, 1878, p. 539.

Lacerta depressa, var. *rudis*, Bedriaga, Abh. Senck. Ges. 1886, p. 275; Bouleng. Cat. Liz. iii, p. 34 (1887).

Lacerta depressa, Boettg. Ber. Senck. Ges. 1889, p. 204.

Lacerta muralis, var. *depressa*, part., Boettg. Ber. Senck. Ges. 1892, p. 140; Derjugin, Ann. Mus. Zool. St. Pétersb. vi, 1901, p. 99.

Lacerta muralis, var. *rudis*, Bouleng. Proc. Zool. Soc. 1904, ii, p. 337, pl. xxii, fig. *c*, and Tr. Zool. Soc. xx, 1913, p. 196, pl. xxii, figs. 7, 8.

Lacerta saxicola, subsp. *rudis*, Méhely, Ann. Mus. Hung. vii, 1909, p. 529, pl. xviii, fig. 7; Nikolsky, Herp. Caucas. p. 75 (1913).

Form rather stout, head and body much flattened. Head once and one-third to once and a half as long as broad, its depth equalling the distance between the centre of the eye and the tympanum; snout obtusely pointed. The hind limb reaches the shoulder or the collar in the male, the shoulder, the axil, or the elbow in the female; foot usually longer than the head.

Rostral not entering the nostril; suture between the nasals very short,* nasal sometimes forming a suture with the anterior loreal; frontal as long as or shorter than its distance from the end of the snout; series of granules between the supraoculars and the superciliaries usually complete; occipital much shorter, and often broader than the interparietal; parietal more or less distinctly emarginate on the side † for the accommodation of a large supratemporal, which is usually in contact with the upper postocular; temporal scales granular; masseteric and tympanic shields usually large‡; usually four, sometimes three or five, upper labials anterior to the subocular.

25 to 34 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold absent or feebly marked. Collar-edge entire; 7 to 11 collar-plates.

Scales on body oval or oval-hexagonal, more or less distinctly keeled,

* Sometimes forming a suture with the frontonasal.

† Very indistinctly in the type figured, Proc. Zool. Soc. 1904, ii, pl. xxii, fig. *c*.

‡ Masseteric shield small in the specimens from Tchorok and Tcherneia Aragdona.

somewhat enlarged towards the ventrals, 45 to 52 * across the middle of the body, 35 to 40 corresponding to the length of the head, 3 or 4 or 2 or 3 to a ventral plate.

Ventral plates in 24 to 29 transverse series. Preanal plate large, usually preceded by a transversely enlarged plate.

Scales on upper surface of tibia considerably larger than dorsals and strongly keeled. 15 to 23 (usually 16 to 21) femoral pores on each side. 25 or 26 lamellar scales under the fourth toe.

Upper caudal scales very strongly keeled, those on the sides raised, subtrigonal, almost spinose, truncate behind; the whorls alternately longer and shorter, and the scales of the two median dorsal series of every other whorl much wider than the others. 18 to 26 scales in the fourth whorl behind the postanal granules.

Brown or greyish olive above, darker on the sides, which bear round light spots; a dorsolateral series of round light spots or ocelli, which may disappear in the adult; back with small dark spots, which often form a double vertebral series; lower parts whitish, with blue spots on the outer row of ventral plates.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From end of snout to vent .	83	70	60	68	55
„ „ „ fore limb	34	27	23	26	18
Length of head	21	16	15	16	13
Width of head	16	11	9	11	8
Depth of head	10	6·5	6	7	5
Fore limb	30	25	20	24	19
Hind limb	42	38	32	37	29
Foot	22	22	17	20	15

Particulars of the five specimens examined:

	1.	2.	3.	4.	5.	6.	7.
♂ Batum, **B.C.**	83	45	25	10	28	21–22	25
♀ Type of var. *rudis* . . .	70	52	28	9	25	17–19	25
„ „ „ **T.M.** . .	60	51	27	9	25	18	25
„ Tchorok, Caucasus . .	68	45	25	11	34	18–17	26
„ Tcherneia Aragdona, **B.C.** .	55	50	28	10	27	18–19	25

Columns as on p. 175.

Although one of the most distinct forms of *L. muralis*, the Caucasian var. *rudis* is, however, connected by intermediate specimens with the var. *saxicola*, as observed by Méhely.

* 46 to 58 according to Méhely.

19. LACERTA CHLOROGASTER.

Lacerta muralis, var. *defilippii*, part., Boettg. in Radde, Faun. Flor. Casp.-Geb. p. 44 (1886).

Lacerta chlorogaster, Boul. Proc. Zool. Soc. 1908, p. 934, pl. lxvii, and Tr. Zool. Soc. xxi, 1916, p. 52, pl. iv, figs. 1, 2.

Lacerta boettgeri, Méhely, Ann. Mus. Hung. vii, 1909, p. 583, pls. viii, fig. 9, xxii, figs. 5 and 6, and xxiii, fig. 6,* and Zool. Anz. xxxv, 1910, p. 593; Nikolsky, Ann. Mus. Zool. Ac. St. Pétersb. xv, 1910, p. 497, and Herp. Caucas. p. 87 (1913); Werner, Jahrb. Hamb. Wiss. Anst. xxx, 1913, p. 15.

Head and body moderately depressed. Head rather large in males (rarely 4 times in length to vent), $1\frac{1}{2}$ to $1\frac{3}{5}$ times as long as broad, its depth equal to the distance between the anterior corner or the centre of the eye and the tympanum; occipital region convex; snout obtuse, as long as postocular part of head; cheeks not much swollen in the male; length of pileus about twice its width. Neck sometimes as broad as head, usually narrower. Hind limb reaching the shoulder or the collar in the male, the elbow or the axil in the female; foot longer than the head. Tail cylindrical, about twice as long as head and body.

Nostril pierced between the nasal, a postnasal, the first upper labial, and sometimes the rostral. Nasals forming a suture behind the rostral; frontonasal broader than long; frontal as long as or a little shorter than its distance from the end of the snout, $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, as broad behind as the principal supraoculars, sometimes in contact with† or narrowly separated from the first supraocular; parietals $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, usually not in contact with the upper postocular,‡ the outer border straight and oblique or more or less emarginate in front for the accommodation of the upper temporal; occipital usually shorter and broader than the interparietal, sometimes as long or as broad. The two major supraoculars, of which the first is usually the longer, separated from the superciliaries by a complete series of granules; the fourth supraocular usually in contact with the first upper temporal; 6, rarely 7, superciliaries, first or second longest, the suture between the first and

* *Lacerta boettgeri*, Méhely, Ann. Mus. Hung. v, 1907, p. 88, is a mere *nomen nudum*. No definition, not even an indication of the habitat.

† In 4 specimens out of 23.

‡ 3 exceptions out of 23 specimens.

second vertical. Rostral often touching or entering the nostril*; a single postnasal†; two loreals, first usually shorter than second. 4 upper labials anterior to the subocular,‡ the lower border of which is much shorter than the upper. Temple covered with small scales, with a large, moderate, or small§ masseteric shield, which is sometimes divided, and a curved tympanic; a large anterior upper temporal, followed by smaller shields.

No pterygoid teeth.

19 to 27 gular scales in a straight line between the symphysis of the chin-shields and the median collar-plate, these scales usually rather large towards the collar; gular fold feeble or very indistinct; collar with feebly serrated edge, composed of 7 to 9 plates.‖

Dorsal scales usually hexagonal, longer than broad, strongly keeled, juxtaposed or feebly imbricate, rarely more oval and less strongly keeled; lateral scales more feebly keeled, smooth towards the ventrals, a little smaller, 3 or 4 corresponding to the length of a ventral plate; 32 to 42 scales, in the middle of the back, corresponding to the length of the head; 44 to 52 scales across the middle of the body.¶ Ventral plates in 6 longitudinal series, the second series on each side from the median line the broadest; 24 to 27 transverse series in males, 27 to 30 in females. Preanal plate large, bordered by a single semicircle of small plates.

Scales on upper surface of tibia smaller than dorsals, keeled. 27 to 32 lamellar scales under the fourth toe. 14 to 19 femoral pores on each side, usually 15 to 17.

Upper caudal scales straight or slightly oblique, strongly keeled, posterior border obtusely pointed, sometimes nearly truncate, the whorls alternately longer and shorter; 22 to 28 scales in the fourth or fifth whorl behind the postanal granules.

Head and back greyish olive or greenish in the male, with or without small black spots or vermiculations; sides and limbs yellowish green with a black network, often enclosing rather large whitish ocellar spots, or black with small yellowish grey spots; a few turquoise-blue spots may be present behind the shoulder. Pale brown or golden-brown above in the female, with small blackish spots and a dark brown lateral band with wavy outlines; sometimes a dorsolateral series of small

* In 25 cases out of 46.

† Two superposed postnasals in one specimen from Lenkoran, according to Méhely.

‡ 5 in a single specimen.

§ Large in 17 specimens, moderate in 2, small in 4.

‖ Up to 10 according to Werner.

¶ 40 to 50 in specimens from Teheran, according to Werner.

whitish spots. The markings of the body usually continued on the anterior part of the tail. Lower parts yellowish green to bright grass-green in the males, with a series of turquoise-blue spots on the outer ventral plates, which are usually also spotted with black, and with the throat often blue or bluish green; anal region and lower surface of hind limbs often lemon-yellow.

The very young is described by Méhely as uniform brown above, the belly dotted or spotted with blackish.

Measurements (in millimetres):

	♂		♀	
From end of snout to vent	65	61	62	57
,, ,, ,, fore limb	24	24	24	18
Length of head	17	17	15	13
Width of head	11	10	9·5	8
Depth of head	9	8	8	6·5
Fore limb	24	24	22	19
Hind limb	35	34	33	29
Foot	18	19	17	16
Tail	—	121	—	—

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Enzeli, type	63	50	25	8	23	14–15	32
,, ,, ,,	63	49	25	8	27	16	30
,, ,, ,,	61	50	25	8	26	16–17	27
,, ,, ,,	58	44	24	7	20	16–17	30
,, ,, ,,	50	50	26	9	23	17–18	30
♀ ,, ,,	60	48	30	8	24	14–15	27
,, ,, ,,	57	47	30	8	23	14–15	28
♂ Resht	65	48	26	7	22	17–16	28
,, ,,	63	50	25	7	20	15	27
,, ,,	63	47	25	8	21	17–16	30
,, ,,	60	49	26	8	25	16	28
,, ,,	58	48	25	8	22	16	30
,, ,,	58	47	24	7	19	14–15	29
,, ,,	58	48	26	8	22	17	29
,, ,,	58	49	25	7	22	17–16	29
,, ,,	56	45	26	7	21	16	30
,, ,,	56	46	26	7	23	19–17	29
,, ,,	56	52	26	8	22	17–18	31
,, ,,	56	49	25	8	21	17–15	29

		1.	2.	3.	4.	5.	6.	7.
♂	Resht	56	47	27	9	19	17–16	30
„	„	55	52	26	8	24	18–17	32
♀	„	62	48	27	8	24	17	29
„	„	58	46	29	7	21	17–16	30

Columns as on p. 175.

Habitat.—The south and south-west coast of the Caspian Sea; the specimens examined by me are from Enzeli and Resht, in Persia; those described by Méhely are from Lenkoran and Baku in Transcaucasia and Astrabad in Persia. The species is also reported from Teheran by Werner.

In the shape of the head, in the serrated collar, in the pointed caudal scales, *L. chlorogaster* bears some resemblance to *L. taurica*, and Méhely finds a great similarity between the skulls of the two species; the keeled dorsal scales contrasting with the smaller laterals is a character shared, to a stronger degree, by *L. praticola*. Yet I do not think there is any close relationship between the three species. There is on the whole more in common with *L. muralis*, vars. *saxicola* and *caucasica*, as recognized by Méhely. *L. chlorogaster* differs from all the forms of *L. muralis* in combining keeled, usually hexagonal dorsal scales with smaller laterals. It would perhaps be better to regard *L. chlorogaster* as a variety of *L. muralis*, more primitive, in most respects, than any of the Transcaucasian-Persian forms with which we are at present acquainted. Apart from the shape of the head it is not without resemblance to the African *L. jacksonii*, the two often agreeing very closely in the markings, and although its true affinities are still a puzzle, I cannot think of a better position for it in the serial arrangement that has to be followed than between *L. muralis* and *L. jacksonii*.

20. LACERTA JACKSONII.

Lacerta jacksoni, Boulenger. Proc. Zool. Soc. 1899, p. 96, pl. x; Peracca, Ruwenzori, i, p. 166 (1909); Boulenger. Tr. Zool. Soc. xix, 1909, p. 242; Degen, Proc. Zool. Soc. 1910, p. 19; Sternf. in Schubotz, Wiss. Ergebn. Deutsch. Z.-Afr. Exped., Zool. ii, p. 215 (1912); Boulenger. Tr. Zool. Soc. xxi, 1916, p. 55, pl. iv, fig. 3.

Lacerta jacksoni, subsp. *kibonotensis*, Lönnberg, in Sjöstedt, Kilim.-Meru Exped., Rept. Batr. p. 5 (1907), and Svensk. Vet.-Ak. Handl. (2), xlvii, No. 6, 1911, p. 14.

Head and body much depressed. Head large in the full-grown male ($3\frac{2}{3}$ to 4 times in length to vent), $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, its depth equal to the distance between the posterior corner of the eye

and the anterior border of the tympanum; occipital region quite flat; snout obtusely pointed, shorter than postocular part of head; cheeks swollen in the male; length of pileus twice or a little more than twice its width. Neck as broad as head. Hind limb reaching the axil, the shoulder, or the collar in the male, the elbow in the female; foot as long as the head in the male, usually a little longer in the female. Tail cylindrical, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as head and body.

Nostril pierced between the nasal, a postnasal, and the first upper labial. Nasals forming a suture behind the rostral*; frontonasal broader than long; frontal as long as its distance from the rostral or the end of the snout, $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, as broad behind, as the principal supraoculars or a little broader; parietals $1\frac{2}{3}$ to $1\frac{4}{5}$ times as long as broad, outer border straight or convex, usually not in contact with the upper postocular, or, if in contact, very narrowly.† Of the two major supraoculars, the first is the longer; 5 or 6 superciliaries, the suture between the first and second oblique; an incomplete series of granules between the supraoculars and the superciliaries, the granules sometimes reduced to 2 or 3.‡ No foramen in the interparietal.§ Occipital usually shorter than the interparietal, sometimes broader.

Rostral not entering the nostril; a single postnasal; two loreals, first shorter than second. 4 (rarely 5) upper labials anterior to the subocular, the lower border of which is not or but little shorter than the upper. Temple covered with small scales, as large as or smaller than dorsals,‖ these scales sometimes feebly keeled; no masseteric shield; tympanic shield sometimes moderate, sometimes small, sometimes absent; upper temporal moderately broad, long or short, usually followed by a series of smaller shields.¶

No pterygoid teeth.

* In one specimen examined by Peracca, the frontonasal touches the rostral.

† More extensively in the specimen of the var. *kibonotensis* which I have examined in the Paris Museum.

‡ In one specimen examined by Peracca the series of granules is complete on one side and totally absent on the other. The series is complete in one of the specimens described by Sternfeld, absent in a male from the Alluaud Collection in the Paris Museum.

§ This important character, first pointed out by Degen, is found in one other species of the genus *Lacerta*, the West African *L. echinata*, Cope. That it is not to be regarded as of generic importance is shown by the genera *Draco*, *Naeraa*, and *Latastia*, where we find the foramen present in some species and absent in others.

‖ Larger in specimens from the Kilimanjaro district (subsp. *kibonotensis*).

¶ Absent in a female from Kegamain and in the two males in the Paris Museum.

21 to 26 * gular scales in a straight line between the symphysis of the chin-shields and the median collar-plate, these scales strongly increasing in size towards the collar; gular fold more or less distinct: collar even-edged or very slightly serrated, composed of 7 to 10 plates.

Dorsal scales rhombic-hexagonal, more or less distinctly keeled, juxtaposed or subimbricate: laterals a little smaller, feebly and diagonally keeled or nearly smooth. 37 to 48 scales across the middle of the body †; 23 (♀) to 35 (♂) scales, in the middle of the back, corresponding to the length of the head, 2 or 3 on the sides corresponding to a ventral plate. Ventral plates in 8 longitudinal series, the second series on each side from the median line much broader than the others, the outer series composed of very narrow plates: 23 to 25 transverse series in males, 27 or 28 in females.‡ Preanal plate large, with one or two semicircles of smaller plates, one of the median of which is more or less enlarged, and may be described as a second preanal.

Scales on upper surface of tibia smaller than dorsals, strongly keeled. 22 to 26 lamellar scales under the fourth toe. 16 to 21 femoral pores on each side.§

Upper caudal scales oblique, strongly keeled, with truncate or very obtusely pointed posterior border; the whorls alternately longer and shorter: 26 to 32 scales in the fourth or fifth whorl behind the postanal granules.

Brown above, sometimes more or less greenish above in life, with small black spots irregularly disposed: sides darker, with 4 or 5 series of white, black-edged ocelli, the upper series very regular and extending from the outer edge of the parietal shield to the base of the tail: a large black spot on each upper labial: limbs with small ocellar spots. Lower parts bright yellow, or belly bluish green, in life (whitish or bluish in spirit): belly sometimes with large black spots, or with small black spots on the sides. Tail with small dark and light spots above, the dark spots sometimes disposed quincuncially.

* Up to 28 according to Degen and Sternfeld.

† 32 to 39 according to Pernetz and Sternfeld: up to 40 according to Degen.

‡ 23 to 25 in males, 24 to 28 in females, according to Pernetz, Degen and Sternfeld.

§ 14 to 20 according to Pernetz and Sternfeld.

¶ "I saw once or twice green-headed and more or less green-backed lizards run up on the trunks of big cedar trees. I had unfortunately no means of securing them, but I have no doubt that they were Jackson's Lizards" (Lönnberg, l.c. 1911). The variation in colour is therefore exactly as in *L. chlorogaster*, which may be precisely similar in its markings.

Measurements (in millimetres):

	1.	2.	3.	4.
From end of snout to vent	85	70	78	71
,, ,, ,, fore limb	32	29	28	27
Length of head	22	19	17	17
Width of head	15	12	10	11
Depth of head	10	9	8	8
Fore limb	28	26	24	25
Hind limb	41	37	35	35
Foot	21	20	19	19

1. ♂, Mt. Elgon. 2. ♂, Mau Ravine (type). 3. ♀, Kegamaia. 4. ♀, Mt. Ruwenzori.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Mau Ravine (type)	70	40	24	10	25	16–17	26
♀ Mt. Ruwenzori	71	37	27	9	22	18–19	25
♂ Mt. Elgon	90	42	24	7	26	17	?
,, ,,	85	40	23	8	26	18–20	26
,, ,,	78	38	24	7	25	17	22
,, Kegamaia, **N.M.**	78	37	23	8	21	17	22
,, ,, ,,	69	41	25	9	25	16	23
♀ ,, ,,	78	43	28	8	26	19–18	23
♂ Kilimanjaro (type of v. *kibonotensis*), **P.M.**	62	37	24	8	23	16–17	24
,, Brit. E. Africa ,,	70	48	25	8	26	21–20	24

Columns as on p. 175.

Habitat.—East and Central Africa. The type is from the Mau Mountains in British East Africa. The species occurs also in the Kilimanjaro and Usambara districts, on Mount Ruwenzori, and on Lake Kivu. It is a mountain form, the specimens in the British Museum having been obtained between the altitudes of 7000 and 8500 feet.

The absence of the parietal foramen distinguishes this species from all other members of the group. There is much in common with *L. chlorogaster*, both as regards lepidosis and coloration, but the head is much flatter, the snout shorter in proportion to the postocular part of the head, the dorsal scales are larger, the ventral plates form 8 longitudinal series instead of 6, the toes are shorter, etc.

21. LACERTA BRANDTII.

Lacerta brandtii, De Filippi, Arch. Zool. An. Fis. ii, 1863, p. 387, and Viagg. Pers. p. 354 (1865); Blanf. Zool. E. Pers. p. 362, pl. xx, fig. 1 (1876); Boettg. in Radde, Faun. Flor. Casp.-Geb. p. 42 (1886); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 268; Bouleng. Cat. Liz. iii, p. 38 (1887); Nikolsky, Herp. Ross. p. 139 (1905), and Herp. Caucas. p. 91 (1913); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 58, pl. ii, fig. 13.

Head and body feebly depressed, as in *L. taurica*. Head about 1½ times as long as broad, its depth equal to the distance between the anterior corner of the eye and the tympanum; snout obtuse, as long as postocular part of head; cheeks not much swollen in the male; length of pileus twice its width. Neck a little constricted. Hind limb reaching the shoulder in the male, the elbow or the axil in the female; foot longer than the head. Tail cylindrical, about twice as long as head and body.

Nostril pierced between the nasal, two postnasals, and the first upper labial. Nasals forming a suture behind the rostral; frontonasal broader than long; frontal 1⅔ to 2 times as long as broad, nearly as broad, behind, as the principal supraoculars, not in contact with the first supraocular; parietals 1½ to 1⅔ times as long as broad, not in contact with or just touching the upper postocular, the outer border straight or slightly concave for the accommodation of the temporal; occipital small, ¼ to ⅓ the length of the interparietal, which is equally broad or a little broader. The two major supraoculars, of which the first is the longer, separated from the superciliaries by a complete series of granules, or the first in contact with the first or first and second superciliaries; the fourth supraocular usually in contact with the first upper temporal; 6 or 7 superciliaries, first usually longest, the suture between the first and second more or less oblique.

Rostral touching or nearly touching the nostril; two superposed postnasals; two loreals, first not more than half as long as second. 5 upper labials anterior to the subocular,* the lower border of which is much shorter than the upper. Temporal region with rather large scales; masseteric shield present, small or large; tympanic present; two or three upper temporals, first largest.

Pterygoid teeth strongly developed.

23 to 25 scales and granules in a straight line between the sym-

* "Nahezu constant," Boettger.

physis of the chin-shields and the median collar-plate; gular fold distinct; collar not or but feebly serrated, composed of 7 to 9 plates.

Body covered with small, smooth granules, which are slightly smaller on the sides than on the back; 50 to 55 scales across the middle of the body, 3 or 4 transverse series corresponding to a ventral plate, 38 to 42 in the middle of the back corresponding to the length of the head. Ventral plates in 8 (or 10 ?)* longitudinal series, broader than long, subequal, or the second series from the median line the broadest; in 28 to 30 transverse series. Preanal plate rather large, bordered by two semicircles of small plates. Scales on upper surface of tibia smaller than dorsals. 25 or 26 lamellar scales under the fourth toe. 16 to 20 femoral pores on each side.

Caudal scales truncate, the upper rather oblique, diagonally and rather strongly but obtusely keeled, the lower smooth (in the basal third); apical pits very distinct; the whorls not very unequal in length; 28 or 30 scales in the fourth whorl behind the postanal granules.

The coloration of the type specimens is thus described by Blanford: Centre of back olive-grey; a rather irregular whitish line down each side (originating behind the supratemporal shields), breaking up behind into white spots, with irregular mottling and spots of black forming an indistinct band inside and outside the white one; another ill-marked pale line down the lower portion of each side, the ground colour of which, and of the breast and abdomen, is pale greenish blue, the anterior and inner margins of most of the ventral plates near the sides being black. According to De Filippi, there are some blue spots near the axillary region, and the anal region and lower part of the tail are tinged with fiery red.

The following notes refer to three well-preserved specimens recently received from M. L. A. Lantz.

Male pale brown above, with small black spots having a tendency to form a reticulation; sides of head and body with numerous whitish dark-edged ocellar spots, the largest in and above the axil; throat and belly white; outer ventrals blue, with small black spots; anal region, lower surface of thighs, and lower surface of tail reddish.

Female not unlike the preceding, but with the white dorsolateral streak distinct on the nape and continued as a regular series of spots on the body; a second series of white spots from the ear to the side of

* De Filippi gave ten as the number of longitudinal rows. Blanford, redescribing the type specimens, two in number, says :—"Eight longitudinal rows, all nearly equal in size: in one of the specimens there is an additional row of much smaller scales on each side, but it is broken up in the other specimen."

the body, which is marked with small black and whitish spots; a series of black spots along each side of the back, within the dorsolateral light streaks or series of spots; two or three large blue, black-edged ocelli above the axil; except for the absence of a dark vertebral streak on the nape, the markings of this female are very similar to those of certain specimens of *L. parva*, and they are obviously derivable from them. Throat and belly bluish, with small black spots on the outer ventrals; anal region, thighs and lower surface of tail reddish. A dark streak along each side of the tail, on the base of which the dark and light dorsal markings are continued.

Young greyish above, the sides with a blackish network enclosing round white spots; two series of vermicular black markings along the back; two large blue, black-edged ocelli above the axil.

Measurements (in millimetres):

	♂	♀
From end of snout to vent	66	58
„ „ „ fore limb	25	22
Length of head	17	14
Width of head	11	9·5
Depth of head	8	7·5
Fore limb	23	19
Hind limb	35	28
Foot	19	16

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Ardebil, Persia	66	54	28	23	9	18–19	25
♀ „ „	58	53	29	25	7	18	26
„ Rasano, Talisch	55	50	30	25	9	19–18	26

Columns as on p. 175.

Habitat.—Known only from North-Western Persia and the neighbouring Transcaucasian Province of Talisch. The type specimens are from Basminsk, between Tabriz and Teheran. M. Lantz's specimens are from a salt lake near Ardebil.

I regard *L. brandtii* as one of the most primitive members of the *L. muralis* group, which it connects with *L. parva*. Among the species with two superposed postnasals it agrees with *L. lævis* in having teeth on the pterygoids, but differs in the temporal lepidosis, in the smaller occipital, in the 8 (or 10) rows of ventrals, and in the shorter toes.

22. LACERTA LÆVIS.

Lacerta lævis, Gray, Ann. N. H. i, 1838, p. 279, and Cat. Liz. p. 31 (1845); Günth. Proc. Zool. Soc. 1864, p. 488; Bouleng. Proc. Zool. Soc. 1881, p. 742; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 263; Bouleng. Cat. Liz. iii, p. 39 (1887), and Tr. Zool. Soc. xxi, 1916, p. 60, pl. iv, figs. 4, 5.

Podarcis judaica, Camerano, Atti Acc. Torin. xiii, 1877, p. 92, pl. ii, figs. 2–5.

Lacerta judaica, Bedriaga, Arch. f. Nat. 1880, p. 270; Boettg. Ber. Senck. Ges. 1879–80, p. 172.

Lacerta muralis, var. *judaica*, F. Müll. Verh. Nat. Ges. Basel, vii, 1882, p. 156.

Lacerta muralis, part., Nikolsky, Herp. Ross. p. 130 (1905).

? *Lacerta lævis*, Werner, Sitzb. Ak. Wien, cxi, i, 1902, p. 1091, and Zool. Jahrb., Syst. xix, 1903, p. 332, pl. xxiii, fig. 4.

Size and shape of head and elongation of body very different according to the sexes, the difference even greater than in *L. peloponnesiaca*. Head $1\frac{2}{5}$ to $1\frac{2}{3}$ times as long as broad, rather strongly depressed in the female, but little broader than deep in the full-grown male, its depth in the tympanic region equal to the distance between the anterior corner or the centre of the eye and the tympanum, its length 4 to 5 times in length to vent in the female, $3\frac{1}{2}$ to $3\frac{4}{5}$ times in the male; snout obtusely pointed, as long as or a little shorter than postocular part of head; cheeks moderately swollen in the male; pileus 2 to $2\frac{1}{4}$ times as long as broad.

Neck as broad as the head or a little narrower. Body moderately depressed.

Hind limb reaching the wrist or the elbow, rarely the axil, in females, the collar or between the collar and the ear in males; foot longer than the head.

Tail cylindrical, often a little flattened at the base, twice or a little over or a little under twice as long as head and body.

Nostril pierced between the nasal, two postnasals, the first upper labial, and the rostral. Nasals usually forming a suture behind the rostral*; frontonasal as long as broad or a little broader than long; frontal as long as or shorter than its distance from the end of the snout, $1\frac{1}{3}$ to 2 times as long as broad, nearly as broad, behind, as the major supraoculars or a little broader; in large males the frontal sometimes trilobate in front, as in *L. peloponnesiaca*; parietals $1\frac{1}{4}$ to

* Rostral in contact with the frontonasal in 3 specimens from Sidon.

$1\frac{3}{4}$ times as long as broad, usually not in contact with the upper postocular, outer border convex, or oblique in front, where it forms a suture with the upper temporal, but not concavely emarginate; occipital constantly broader than the interparietal, sometimes broader than the frontal, at least as long as the interparietal in males, usually shorter in females. Of the two major supraoculars, the first is usually the longer; fourth supraocular usually in contact with the upper temporal*; 5 to 7 superciliaries, first usually longest; suture between the first and second nearly as often oblique as vertical; a series of granules between the supraoculars and the superciliaries, the series complete or the first or first and second superciliaries in contact with the supraoculars.

Rostral entering the nostril, usually largely; two superposed postnasals†; two loreals, first shorter than second. 5, rarely 4 or 6‡ upper labials anterior to the subocular, the lower border of which is usually much shorter than the upper. Temporal scales granular, about as large as the dorsal scales or a little larger; a large or very large masseteric shield§; tympanic shield distinct; a large upper temporal, followed by a row of very small shields or mere granules.

Pterygoid teeth usually present.

18 to 24 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold distinct; collar with even or feebly serrated edge, composed of 9 to 13 plates (exceptionally 7).

Scales on body juxtaposed, oval or hexagonal, keeled, the keel usually stronger in males than in females, rather smaller on the sides than on the back; minute granules in the interstitial skin‖; 49 to 64 scales (usually 50 to 58) across the middle of the body, 3 or 4 transverse series, on the sides, corresponding to a ventral plate, 33 to 55, in the middle of the back, corresponding to the length of the head. Ventral plates in 6 longitudinal series, or if in 8¶

* 16 exceptions out of 140 cases.

† I have come across 2 exceptions only, in a male from Damascus, which has a single postnasal on the right side, and in another from Sidon, in which it is so on both sides.

‡ 4 in 15 cases out of 140, 6 in 3 cases.

§ Only two exceptions; in a female from Damascus, in which the shield is hardly distinct on the right side, and in another from the Nahr Kadischa, in which it is disintegrated on both sides.

‖ As first pointed out by Bedriaga; these accessory granules are to be found in nearly all species of *Lacerta*, when the skin is distended, and they are more distinct still in *L. jayakari*.

¶ In two male specimens from Damascus; these outer plates about half the width of those of the third series from the middle line.

the outer very small; all broader than long, the median pair narrowest, the other two nearly equal in width; 23 to 27 transverse series in males, 25 to 29 in females. Preanal plate large, bordered by one or two semicircles of small plates.

Scales on upper surface of tibia smaller than dorsals, with a strong keel, often with small tubercles or short secondary keels in addition. 27 to 35 lamellar scales under the fourth toe (usually 29 to 32). 16 to 24 femoral pores on each side (usually 18 to 21).

Upper caudal scales rather narrow, straight or slightly oblique, strongly keeled, the keel sometimes accompanied by a groove on each side,* truncate or very obtusely pointed behind, mostly with a distinct apical sensory pit; the whorls more or less unequal in length, sometimes very slightly; 24 to 34 scales in the fourth or fifth whorl behind the postanal granules.

Grey or pale brown above, the back uniform or scantily dotted or spotted with blackish, occasionally with larger spots having a tendency to arrange themselves in transverse series; upper surface of head without spots; a black lateral band, passing through the eye, sometimes well defined by a white streak above and beneath, to above the shoulder, where its lower limit shades off into the lighter colour of the flanks and its upper border is festooned or crenulate; white dots or round white spots on the black of the sides; sides sometimes only a little darker than the back, with black and white ocelli; limbs with a dark network, often enclosing round white spots; tail uniform or with small dark spots irregularly disposed. Lower parts white, throat of male sometimes bluish, without spots, except in males; a series of rather distant blue, black-edged spots along each side of the belly.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.
From end of snout to vent .	87	78	58	80	71	52
„ „ „ fore limb	33	30	23	29	25	19
Length of head . . .	24	22	15	19	15	13
Width of head . . .	16	15	10	12	10	8
Depth of head . . .	14	13	7·5	10	7	6
Fore limb	32	30	21	27	24	18
Hind limb	52	52	33	44	39	30
Foot	27	26	19	24	19	16
Tail	—	170	110	160	—	—

1, 2. ♂, Damascus. 3. ♂, Jerusalem. 4. ♀, Damascus. 5. ♀, type. 6. ♀ (gravid), Jerusalem.

* As in *L. danfordii*, var. *græca*.

Particulars of Specimens Examined.

			1.	2.	3.	4.	5.	6.	7.
♀	—? (type)	. . .	71	56	29	9	22	19	27
♂	Damascus (Anderson)	. .	82	58	25	11	22	21	35
,,	,,	,, . .	56	61	25	12	23	20–21	30
♀	,,	,, . .	68	60	28	9	22	20–18	31
♂	,,	(Gadeau de Kerville)	87	56	26	10	22	21	30
,,	,,	,, .	84	58	25	12	23	20–19	30
,,	,,	,, .	83	60	25	12	22	19–18	31
,,	,,	,, .	80	58	26	12	22	24–22	31
,,	,,	,, .	80	60	24	11	21	21	30
,,	,,	,, .	80	51	25	10	19	18–19	32
,,	,,	,, .	80	54	25	12	22	21–20	30
,,	,,	,, .	78	58	24	9	21	20–18	30
,,	,,	,, .	78	53	25	13	22	24	33
,,	,,	,, .	78	58	27	11	22	21–19	29
,,	,,	,, .	78	54	25	12	21	20	30
,,	,,	,, .	77	50	26	12	19	19–21	31
,,	,,	,, .	77	59	25	12	24	22	32
,,	,,	,, .	77	57	26	10	21	21–20	29
,,	,,	,, .	75	55	26	11	21	22–20	31
,,	,,	,, .	66	52	25	11	20	18–19	32
,,	,,	,, .	66	55	26	10	21	19–20	29
,,	,,	,, .	64	52	24	9	23	20–22	31
♀	,,	,, .	87	54	29	10	23	19	30
,,	,,	,, .	84	52	29	9	20	19–18	32
,,	,,	,, .	83	49	28	9	21	19–20	30
,,	,,	,, .	77	52	28	10	21	19	30
,,	,,	,, .	77	51	29	10	20	19	29
,,	,,	,, .	76	52	27	9	20	19	31
,,	,,	,, .	76	53	29	10	20	19	32
,,	,,	,, .	76	51	27	13	23	19–20	29
,,	,,	,, .	76	51	27	9	20	19	29
,,	,,	,, .	75	52	29	11	22	18	32
,,	,,	,, .	75	55	27	12	22	19	31
,,	,,	,, .	74	53	27	12	22	18	32
,,	,,	,, .	74	50	27	10	21	18–20	32
,,	,,	,, .	72	51	28	10	21	20–19	31
,,	,,	,, .	72	51	29	11	18	20–19	30
,,	,,	,, .	68	57	27	10	20	18	30
,,	,,	,, .	59	52	28	11	22	17–18	30

	1.	2.	3.	4.	5.	6.	7.
♀ Damascus (Gadeau de Kerville)	58	52	27	12	23	21	31
„ „ „	50	50	28	11	18	20–19	29
„ „ „	50	51	28	12	21	18–20	32
♂ Beyrut	73	56	25	7	21	21–19	30
„ „	57	59	26	10	24	20–21	29
„ Sidon	65	62	26	10	22	19	31
♀ „	57	55	27	10	23	21	30
♂ „ **L.M.**	72	62	24	11	21	21–20	30
„ „ „	71	61	25	10	22	22	30
„ „ „	64	59	23	11	21	21–19	31
„ „ „	64	58	27	10	22	19	31
„ „ „	63	62	26	12	19	18–17	33
♀ „ „	70	62	27	10	22	18–19	30
„ „ „	65	55	28	8	22	19	27
„ „ „	61	54	25	10	24	20–19	28
„ „ „	60	64	27	10	19	18	28
♂ Latakia, **L.M.**	63	58	27	9	23	20–19	29
„ Nahr Kadischa, **L.M.**	68	63	25	9	23	22–20	28
„ „ „	65	57	26	11	25	21	33
„ „ „	61	62	24	10	22	21–19	28
„ „ „	60	58	26	11	22	21	30
♀ „ „	73	55	27	11	22	19–21	29
♂ Jerusalem	58	57	25	10	18	18–19	32
„ „	51	61	25	9	21	19–20	31
„ „	50	54	25	9	21	20	31
„ „	47	59	24	9	20	17	31
♀ „	60	54	26	9	20	17–18	27
„ „	52	50	26	10	19	17–16	30
♂ Dead Sea	70	61	26	11	21	20–21	31

Columns as on p. 175.

Habitat.—Syria*; also reported from Rhodes and Cyprus. Although I have, in the course of the past 30 years, looked over several large collections of Cyprus reptiles, I have never come across a specimen of this or any other species of *Lacerta* from that island. A small series of reptiles collected by Mr. C. G. Danford on Rhodes in 1879 contains examples of one *Lacerta* only, *L. viridis*, var. *major*.† The record of this species from the Cilician Taurus by Werner (Jahrb. Nat.

* The numerous specimens in the Lyons Museum have been referred by Lortet to *L. muralis* and *L. taurica*.

† *L. danfordii* is, however, known from Rhodes.

Ver. Magdeb. f. 1896–1897, p. 7) is probably based on some aberrant specimen of *L. danfordii*.

In all probability *L. lævis* is directly derived from a form closely related to *L. brandtii*. There is not a single character that can be said to be opposed to such a derivation.

23. LACERTA JAYAKARI.

Lacerta jayakari, Bouleng. Cat. Liz. iii, p. 40, pl. ii (1887), and Tr. Zool. Soc. xxi, 1916, p. 64, pl. iv, figs. 6, 7.

Head and body moderately depressed. Head $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad; snout pointed, as long as postocular part of head; depth of head in the tympanic region equal to the distance between the anterior corner of the eye and the tympanum; cheeks rather swollen in the male; pileus $2\frac{1}{4}$ to $2\frac{1}{2}$ times as long as broad. Neck slightly constricted. Hind limb reaching the collar or a little beyond in the male, the axil or the shoulder in the female; foot as long as the head or a little longer. Tail cylindrical, a little more than twice the length of head and body.

Nostril pierced between the nasal, two postnasals, the first upper labial, and the rostral. Nasals forming a rather long suture behind the rostral; frontonasal as long as broad or a little broader than long; frontal usually shorter than its distance from the rostral, $1\frac{1}{5}$ to $1\frac{1}{2}$ times as long as broad, as broad, behind, as the major supraoculars in the adult (narrower in the young); parietals $1\frac{1}{2}$ to $1\frac{3}{5}$ times as long as broad, with straight or slightly convex outer border, not in contact with the upper postocular; occipital usually as long as and much broader than the interparietal, sometimes shorter and but little broader. Major supraoculars, of which the first is usually the longer, separated from the superciliaries by a complete series of granules; 7 to 9 superciliaries, the suture between the first and second sometimes vertical, sometimes oblique.

Rostral largely entering the nostril; two superposed postnasals; two loreals, first much shorter than second; 6 upper labials anterior to the subocular,* the lower border of which is usually but little shorter than the upper. Temple covered with minute granules, which are smaller than the dorsal scales; the granules in front of the ear may have a tendency to form a denticulation; no masseteric shield; tympanic shield usually well developed, sometimes very small; a large anterior supratemporal shield, in contact with the fourth supraocular, followed by a series of 2 or 3 smaller shields.

* 7 on one side in one of the specimens.

Pterygoid teeth present.

45 to 50 granular scales in a straight line between the symphysis of the chin-shields and the median collar-plate; no gular fold; collar with feebly serrated edge, composed of 13 to 16 plates, all except the median very small.

Scales on body very small, granular, round, convex, smooth or very indistinctly keeled, mostly with a distinct sensory pit; the interstitial skin with very minute granules; 85 to 95 scales across the body; 4 or 5 lateral scales correspond to the length of a ventral plate; 48 to 68 scales, in the middle of the body, correspond to the length of the head. Ventral plates in 8 longitudinal and 27 to 29 transverse series; the plates of the second series from the median line usually broader than the others, those of the outer series smallest. Preanal plate small, bordered by 2 or 3 semicircles of smaller plates.

Scales on upper surface of tibia a little larger than dorsals, obtusely keeled. 29 or 30 lamellar scales under the fourth toe. 25 to 29 femoral pores on each side, the two series nearly meeting in the middle.

Upper caudal scales narrow, straight or nearly straight, strongly keeled, truncate, with a very distinct apical sensory pit; the whorls nearly equal in length; 42 to 50 scales in the fourth or fifth whorl behind the postanal granules.

Young olive-grey above, with numerous black and whitish spots which have a tendency to run together to form wavy transverse bars; a black spot on each upper labial shield; temple white with three black vertical bars; lower parts yellowish white. These markings disappear with age, the adult being uniform pale greyish or brownish olive, with more or less distinct traces of the spots on the body and of the markings on the sides of the head.

Measurements (in millimetres):

	♂	♀
From end of snout to vent	152	155
„ „ „ fore limb	65	65
Length of head	38	37
Width of head	27	22
Depth of head	23	20
Fore limb	56	55
Hind limb	90	85
Foot	42	39
Tail	320	—

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ . . .	152	87	27	15	47	28–27	30
„ . . .	150	85	27	14	48	29	30
„ . . .	124	85	28	?	45	26	29
„ . . .	81	95	27	13	50	28–27	29
♀ . . .	155	93	29	15	48	27–26	30
„ . . .	152	86	29	16	48	25	29
„ **P.M.** . .	140	85	29	16	50	26–27	29

Columns as on p. 175.

Habitat.—*Lacerta jayakari*, named after its discoverer, the late Surgeon-Major A. S. G. Jayakar, is only known from Muscat, Arabia.

This is the giant of the *L. muralis* group. In conformity with the frequent if not absolutely general rule in this genus that in allied forms an increase in size is accompanied by a finer scaling (*L. agilis*—*viridis*—*ocellata*, *L. muralis typica*—*brueggemanni*—*nigriventris*—*bedriagæ*) the size of the scales is so much reduced as to render the definition of this species by a numerical formula extremely easy. It is true that the same high number of scales across the body and of plates in the collar is reached in *L. muralis*, var. *lilfordi*, but the number of gular scales remains lower (40 the maximum), the temporal scales are larger, there are fewer longitudinal rows of ventral plates and anterior labials, and the postnasal is single.

I regard *L. lævis* as the nearest ally of *L. jayakari*. The greater difference in the general proportions between the two sexes, the shorter head, the coarser lepidosis, the presence of a large masseteric shield, the number of ventral plates and of femoral pores, and the pattern of markings are the most striking characters distinguishing the former from the latter, which is one of the most sharply defined species of the genus *Lacerta*. But I do not suggest a derivation of *L. jayakari* from *L. lævis*; I imagine these two species and *L. danfordii* to have been independently evolved out of forms closely related to *L. brandtii*, nearly all the characters of which appear to support such an assumption.

24. LACERTA DANFORDII.

Zootoca danfordi, Günth. Proc. Zool. Soc. 1876, p. 818, fig.

Lacerta danfordi, Bedriaga, Bull. Soc. Nat. Mosc. 1879, p. 30; Bouleng. Proc. Zool. Soc. 1881, p. 741; Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 259; Bouleng. Cat. Liz. iii, p. 37, pl. i, fig. 2 (1887); Boettg. Sitzb. Ak. Berl. 1888, p. 163; Werner, Sitzb. Ak. Wien, cxi, i, 1902, p. 1090, Zool. Anz. xxvii, 1904, p. 255, and Zool. Jahrb., Syst.

xix, 1903, p. 333, pl. xxiii, fig. 3, and xxiv, figs. 7, 11; Méhely, Ann. Mus. Hung. vii, 1909, p. 452, fig., pls. xiii, figs. 4, 5, and xiv, figs. 5–8; Boulenger, Tr. Zool. Soc. xxi, 1916, p. 67, pl. v.

Lacerta oxycephala, vars. *modesta*, *maculata*, part., Bedriaga, Bull. Soc. Nat. Mosc. 1881, p. 80.

Lacerta græca, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 290; Werner, Wiss. Mitth. Bosn. Herzeg. vi, 1899, p. 833, and Zool. Anz. xxvii, 1904, p. 256; Méhely, t.c. p. 463, pls. xiii, figs. 6, 7, and xv, figs. 1–4; Schreib. Herp. Eur., ed. 2, p. 403, fig. (1912).

Lacerta anatolica, Werner, Anz. Ak. Wien, 1900, p. 269, Sitzb. Ak. Wien, cxi, i, 1902, p. 1083, pl. iii, Zool. Jahrb., Syst. xix, 1903, p. 331, pl. xxiv, figs. 5, 12, 14, and Zool. Anz. xxvii, 1904, p. 259; Méhely, t.c. p. 442, pls. xiii, figs. 1–3, and xiv, figs. 1–4.

Lacerta œrtzeni, Werner, Zool. Anz. xxvii, 1904, p. 258; Schreib. op. cit., p. 402, fig.

The following description is drawn up exclusively from the type specimens, from Zebil Bulghar Dagh, Cilician Taurus.

Head and body rather strongly depressed, but less than in *L. oxycephala*, more as in some specimens of the typical *L. muralis*. Head $1\frac{2}{3}$ to a little over $1\frac{1}{2}$ times as long as broad, its depth, in the tympanic region, equal to the distance between the anterior corner or the centre of the eye and the anterior border of the tympanum; snout obtusely pointed, as long as or a little shorter than postocular part of head; cheeks not much swollen in the male; length of pileus 2 to $2\frac{1}{3}$ times its width. Neck at least as broad as head. Hind limb reaching the shoulder or the collar in the male, the axil in the female; foot as long as head or a little longer (not more than once and one-third). Tail cylindrical, nearly twice or more than twice as long as head and body.

Nostril pierced between the nasal, two postnasals, the first upper labial, and the rostral. Nasals forming a suture behind the rostral; frontonasal as long as broad or, more often, broader than long, 2 to 3 times as long as the suture between the prefrontals. Frontal $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, as long as its distance from the rostral or the end of the snout, as broad as or a little narrower, behind, than the principal supraoculars, not in contact with the first supraocular although sometimes very narrowly separated from it. Parietals $1\frac{1}{4}$ (young) to $1\frac{3}{4}$ times as long as broad, usually not in contact with upper postocular,* the outer border more or less distinctly notched for the reception of the large temporal. Occipital as long as or shorter than,† and as

* In contact in 3 cases out of 16.

† In one specimen barely half as long as the interparietal.

broad as or broader than the interparietal. The two major supraoculars, equal in length or the first the longer, separated from the superciliaries by a complete series of granules; the fourth supraocular usually in contact with the upper temporal. 6 or 7 superciliaries, second longest, the suture between them all vertical or nearly so.

Two superposed postnasals; first loreal usually shorter than second. A rather large semitransparent area in the lower eyelid, with 7 to 9 vertically elongate shields. 5 upper labials anterior to the subocular,* the lower border of which is much shorter than the upper. Temporal region with small granular scales; masseteric shield small or absent†; tympanic present; a large anterior supratemporal, followed by granular scales.

No pterygoid teeth.‡

22 to 27 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold absent or merely indicated; collar not serrated, composed of 9 to 12 moderate or small plates.

Body covered with small, smooth granules (sometimes faintly keeled on the posterior part of the back), which are a little smaller on the sides than on the back; 55 to 62 scales across the middle of the body, 3 or 4 transverse series corresponding to a ventral plate, 31 to 44 in the middle of the back corresponding to the length of the head. Ventral plates as often in 8 as in 6 longitudinal series, the fourth series on each side composed of smaller but quite well developed plates; in 26 to 29 transverse series. Preanal plate small or very small, in one (♂) specimen divided into two, bordered by two or more series of small plates or scales; granules between the preanal plate and the anal cleft.§

Scales on upper surface of tibia obtusely keeled, smaller than dorsals. 27 to 31 lamellar scales under the fourth toe. 20 to 25 femoral pores on each side.‖

Caudal scales truncate, the upper more or less oblique, diagonally and strongly but rather obtusely keeled, the lower smooth; apical pits usually very distinct; the whorls not very unequal in length; 30 to 34 scales in the fourth or fifth whorl behind the postanal granules, two behind the latter enlarged in males.

* Rarely 4 or 6 according to Werner.

† Present in 5 cases only out of 16.

‡ Minute teeth or their traces may be present according to Méhely.

§ Absent however in one of the specimens (female). This character has been unduly emphasized by Prof. v. Méhely. I have shown that it is also found in *L. græca*, as well as in some specimens of *L. muralis*.

‖ Rarely 16 to 19 and 26, *fide* Bedriaga, Werner, and Méhely.

Adult males olive-grey or brownish above, with blackish dots and traces of round light spots; younger males with round whitish spots edged with dark brown; sides closely speckled with black, with dark-edged round light spots; head, including lips, speckled with black; limbs speckled or reticulated with black, with more or less distinct round light spots; tail without spots, except at the base; belly greenish white (in spirit), with blackish dots.* Females and young with black dots or spots, or a black network enclosing round light spots; a light, unspotted area along each side of the back, from each parietal shield; belly unspotted or with small black spots.

Measurements (in millimetres):

	♂	♂	♀	♀
From end of snout to vent	75	62	56	52
„ „ „ fore limb	32	24	22	21
Length of head	18	17	14	13
Width of head	13	11	10	9
Depth of head	9	8	6	6
Fore limb	27	23	20	20
Hind limb	41	38	31	30
Foot	18	20	16	17
Tail	152	140	—	93

Habitat.—The types are from Zebil Bulghar Dagh, 4000 feet, presented by Mr. C. G. Danford. Dr. Werner's specimens are from Dumbellek Dagh, also in the Cilician Taurus. The young specimen from Kaisarieh, referred to this species in the Catalogue of Lizards, belongs to *Latastia cappadocica*, Werner. The Syrian specimen mentioned by Barbour (Proc. N. Engl. Zool. Club, v, 1914, p. 84) under the name of *Lacerta danfordi* should be compared with *L. lævis*.

Var. ANATOLICA.

The type specimen (female) of this form is from near Eski Shehir in Central Asia Minor, and I am indebted to Dr. Werner for the examination of two males from the some locality, one of which he has presented to the British Museum. *L. œrtzeni*, Werner, based on Boettger's *L. danfordii* from Rhodes, Samos, and Nicaria (S. Sporades), is regarded by Méhely as identical with *L. anatolica*, although he has omitted to refer to Werner's name in the synonymy.

According to Werner's original description, *L. anatolica* is similar

* Reddish white or red in life, according to Werner; the lips are also red or reddish according to the same author.

to *L. danfordii*, but nearer to *L. oxycephala*. I can see no reason for any near approximation to the latter species, and Méhely more correctly regards *L. anatolica* and *L. danfordii* as "Schwesterarten" agreeing in the most important morphological characters and conforming to the same primary pattern of coloration.

The only important difference resides in the longer head, which is $1\frac{3}{4}$ times as long as broad in the specimen before me (pileus nearly twice as long as broad, parietal shields nearly twice as long as broad), a difference, however, not greater than between two extreme specimens of the var. *tiliguerta* of *L. muralis*, or even of the typical form in the wider sense. I am also far from convinced that this character would hold good if put to the test of a considerable material (which has not been the case); in fact, if Schreiber's figure of one of the type specimens of *L. œrtzeni* is to be at all trusted, the shape of the head may be absolutely the same as in a typical *L. danfordii* (length 20 mm., width 14 mm., parietals barely once and a half as long as broad).

Another character to which undue importance has been assigned by both Werner and Méhely is the number of longitudinal rows of ventral plates, supposed to be 6 in *L. danfordii* and 8 in *L. anatolica*. But I have already pointed out that there may be 8 series in the types of *L. danfordii* and 6 or 8 is given as the number in *L. œrtzeni*, which is identified with *L. anatolica* by Méhely. There is no constancy in another character appealed to by the latter author, viz. the presence of a detached portion of the rostral between it and the nostril—an anomaly which may occur in any species of *Lacerta*, and which, besides, is not shown by Werner's specimens. The divided anal* is likewise inconstant, and is also shown by one of the types of *L. danfordii*, the very one figured by Günther when first describing the species.

The Anatolian specimens have 53 to 60 scales across the body, 8 longitudinal and 27 to 29 transverse series of ventrals, and 15 to 21 femoral pores on each side. Those from the islands (Rhodes, Symi, Samos, Nicaria) have, according to Boettger, 62 to 66 scales, 6 or 8 longitudinal rows of ventrals, and 15 to 21 femoral pores. There are sometimes 6 anterior upper labials, as in the type of *L. anatolica*.†

The type specimen of *L. anatolica* is described as greyish above with grey reticulation and two series of black spots with a tendency to form a network; a blackish lateral band with a series of whitish

* Which Schreiber incorrectly describes as a very small anal.

† Out of 5 specimens from the same locality, described later by Werner, 4 have 5 anterior upper labials, as in the typical *L. danfordii*.

ocellar spots; below this a second series of less distinct ocellar spots; limbs with large white, dark-edged round spots and small black dots; sutures between the labials black; lower parts with black dots. This coloration agrees very closely with that of young specimens of *L. danfordii*. Boettger describes his Nicaria adult specimens (*L. œrtzeni*) as bluish-grey above, with three longitudinal bands of black spots and the lower parts uniform bluish tinged with orange, and the young as quite black above, with four pale green longitudinal streaks, the outer broken up into spots. There is therefore much variation in the markings of the specimens referred to *L. anatolica* by Méhely, who also figures some covered with round whitish spots and with dark cross-bars on the tail, and observes that, although at first sight very different from *L. danfordii*, closer examination reveals these different patterns to belong to the same fundamental plan.

Measurements (in millimetres) of a male from near Eski Shekei:

From end of snout to vent	72	Depth of head	9
„ „ „ fore limb	30	Fore limb	27
Length of head	21	Hind limb	40
Width of head	12	Foot	21

According to Werner the variation in the proportion of length to width of head is 1 : 38 to 1 : 44 in *L. danfordii*,* 1 : 53 to 1 : 74 in *L. anatolica*. This is really the only important difference on which the two forms are based, and I believe it would break down were the specimens from Rhodes, Samos, and the Southern Sporades re-examined. All the other characters that have been adduced in favour of the separation, viz. relation of rostral to nostril, number of longitudinal rows of ventrals, anal scutellation, shape and size of the occipital, and coloration, are subject to such variations as to be useless, and are mostly disposed of by an examination of the series of specimens on which *L. danfordii* was established.

Habitat.—Anatolia, Rhodes, Samos, and Southern Sporades.

Var. GRÆCA.†

This is a distinct form, only known from Southern Greece, which is, however, so closely related to and so completely connected with *L. danfordii* that, according to the standard followed in the genus *Lacerta* (*L. ocellata*, *L. viridis*, *L. muralis*), I cannot accord it higher rank than that of subspecies. That is, after all, perhaps only a matter

* 1 : 55 in one of the specimens of which measurements are given above.

† The name *modesta*, Bedriaga, which has priority over *græca*, cannot be used, being preoccupied in the genus (*L. muralis*, var. *modesta*, Eimer).

of opinion, but what is important is to dispose of the statements hitherto made by different authors as to the characters which were believed to justify a specific separation, such as a longer and flatter head, longer limbs, the shape and size of the occipital shield, the temporal scutellation, the coloration, etc.,* by showing how far they are to be relied upon, and what importance is to be attached to them by analogy with the variations recognised in other better-known allied species, such as *L. muralis* and *L. oxycephala*.

The head is often somewhat flatter and more elongate than in *L. danfordii*, but not constantly, one adult male (from Kambos) being in this respect absolutely identical with one of the types from Asia Minor (see p. 312, measurements, column 2). This individual variation, which is not even so great as in *L. muralis*, var. *bocagii*, is best shown by measurements of a few specimens:

	♂					♀		
	1.	2.	3.	4.	5.	6.	7.	8.
Length of head . .	20	19	19	17	17	17	16	15
Width of head . .	12	12	13	11	10	10	10	9
Depth of head . .	8·5	9	9	8	8	8	7	6
Length of pileus . .	19	18	18	17	16	16	15	14
Width of pileus . .	9	9	9	8·5	8·5	8	7·5	7

1. Langhada. 2–4. Kambos. 5, 8. Lada. 6, 7. Megali.

The head is thus seen to be roughly $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, the length of the pileus about twice its width; the depth of the head equals the distance between the centre of the eye and the anterior border of the tympanum; snout obtusely pointed, as long as or a little longer than postocular part of head. Proportions of limbs and tail as in the typical form.

Rostral usually entering the nostril, sometimes narrowly separated from it. Upper head-shields as in the typical form, except that, when the head is more elongate, the frontal and the frontonasal are longer

* It may be interesting to reproduce here the reasons given by the original describer of *L. græca* for distinguishing it from *L. danfordii*: "Da man kürzlich versucht hat *L. danfordi* mit *L. græca* zu vereinigen, so will ich hierselbst auf die Hauptunterschiede, welche ich zwischen dem mir vorliegenden Exemplar von *L. danfordi* und den *græca* gefunden zu haben glaube, hinweisen: *D. danfordi*. Kopf pyramidal, Rumpf nahezu walzenförmig. Occipitale kleiner als das Interparietale, Massetericum vorhanden; gewölbte, gegen den Schwanz hin gekielte Rumpfschuppen. 19 Schenkeldrüsen. *L. græca*. Kopf und Rumpf abgeplatted. Occipitale grösser als das Interparietale, Massetericum fehlend; ziemlich flache, gegen den Schwanz hin schwach eingedrückte Rumpfschuppen. 22–24 Schenkeldrüsen." (Bedriaga, op. cit. p. 246.)

in proportion; first supraocular often* in contact with the frontal; parietal rarely in contact with the upper postocular†; occipital usually as long as and broader than the interparietal, sometimes much broader and longer, though always narrower than the frontal‡; 6 to 8 superciliaries, first usually longest. Of the two superposed postnasals, the upper is divided into two in one specimen; first loreal sometimes as long as second, sometimes shorter. 5 anterior upper labials, rarely 6§; lower border of subocular usually but little shorter than the upper, but sometimes much shorter; supratemporal sometimes very small; no masseteric shield.‖

26 to 33 scales and granules between the chin-shields and the collar, which is composed of 9 to 12 plates.

Scales smooth or faintly keeled on the posterior part of the body,¶ 52 to 61 across the body.** Ventral plates constantly in 6 longitudinal series and in 25 to 30 transverse series.

Preanal plate rather large, bordered by one or two series of scales; the granules between the anal plate and the anal cleft, believed to be characteristic of *L. danfordii* and *L. anatolica*, as often present†† as absent.

Caudal scales truncate, not or but slightly oblique, the upper with obtuse keels bordered on each side, in the posterior two-thirds of the scale, by a more or less distinct depression or groove‡‡; apical pits very distinct; the whorls usually not very unequal in length, sometimes nearly equal; 30 to 40 scales in the fourth or fifth whorl. 27 to 32 lamellæ under the fourth toe. 20 to 28 (usually 21 to 24) femoral pores on each side.§§

Grey, brownish, or olive above, uniform on the back, or with blackish dots or rather large blackish spots irregularly disposed or forming two more or less regular longitudinal series from the occiput to the base of

* In 6 specimens out of 12 examined by me; in 8 out of 10 examined by Méhely.

† In 5 cases out of 24.

‡ Sometimes smaller than the interparietal according to Schreiber.

§ In 2 cases out of 24.

‖ Exceptionally present, *fide* Schreiber.

¶ More distinctly keeled in a male from Kambos than in any of the typical *L. danfordii*.

** 48 to 65, *fide* Méhely.

†† In 6 specimens out of 12.

‡‡ This peculiarity, which is to be found, though less marked, in some specimens of the typical *L. danfordii*, is conveyed, in a somewhat exaggerated form, by Méhely's figure 7 on pl. xiii.

§§ In one of the specimens (one of Bedriaga's types) there are a few additional pores, forming a second series.

the tail, which is uniform or spotted like the body but never cross-barred; upper surface of head uniform or with small black spots, sides, including the lips, much spotted, the temples often with round light, dark-edged spots; sides of body usually darker than the back, with a dark network enclosing lighter spots or with very well-marked ocellar spots, one of which, above the shoulder, may be enlarged and of a blue colour; upper surface of limbs often with round light, dark-edged spots. Belly greyish or pale yellow in females, bright yellow in males,* uniform or with small black spots, or black edges to the shields; blue spots on the outer ventral shields. In these markings, some of the specimens of *L. græca* and *L. danfordii* are almost identical.

I have never seen the young of the Greek form; nor have I been able to find any allusion to its markings in the descriptions to which I have had access.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From end of snout to vent . .	76	73	65	69	61
„ „ „ fore limb .	32	29	27	27	25
Length of head	20	19	17	17	15
Width of head	12	11	11	10	9
Depth of head	8·5	8	8	8	6
Fore limb	27	25	24	23	21
Hind limb	42	39	36	34	32
Foot	22	20	19	18	17
Tail	170	153	—	—	140

1. ♂, Langhada. 2. ♂, Taygetos (one of the types). 3. ♂, Kambos. 4. ♀, Megali Anastasowa. 5. ♀, Lada.

Habitat.—This form is so far known only from a small part of Southern Greece (Morea), the Taygetos Mountains and neighbouring hills.

Particulars of Specimens Examined.

Forma typica:

	1.	2.	3.	4.	5.	6.	7.	8.
♂, type	75	58	8	27	9	27	25	30
„ „	74	62	8	28	10	25	23–22	31

* Werner has attached great importance to the coloration in defining *L. græca* as distinct from *L. danfordii*, the former being yellow beneath (in life), and the latter red or reddish. There is hardly a form of *L. muralis* in which such a difference is not to be found among various individuals, often even in the same locality. The statement that the loreal region is unspotted is contradicted by some of the specimens before me.

	1.	2.	3.	4.	5.	6.	7.	8.
♂ type	62	58	6	26	12	25	21	27
,, ,, ...	59	55	6	26	12	24	24	28
♀ ,, ...	56	56	6	29	11	25	23–22	28
,, ,, ...	52	56	8	28	11	22	20–21	27
Var. *anatolica*:								
♂ Eski Shehir, C. Asia Minor . . .	72	53	8	27	13	25	19–20	27
,, Ditto, **W.C.** . . .	69	56	8	29	12	24	20	27
Var. *græca*:								
♂ Taygetos (type) . .	73	56	6	26	12	27	23	27
♀ ,, ,, **P.M.** .	58	52	6	28	10	29	25–23	29
♂ Langhada, nr. Sparta .	76	59	6	26	10	27	23–24	32
♀ ,, ,, .	62	58	6	29	11	26	20	28
♂ Kambos, Taygetos .	75	60	6	28	10	33	26–28	29
,, ,, ,, . .	73	53	6	26	10	28	22–23	29
,, ,, ,, . .	65	61	6	26	10	29	25–24	27
,, Lada ,, . .	66	53	6	25	9	29	24–23	28
♀ ,, ,, . .	61	58	6	27	9	29	22–21	28
♂ Megali ,, . .	55	59	6	28	10	30	21–23	32
♀ ,, ,, . .	69	53	6	28	9	29	23–22	30
,, ,, ,, . .	67	52	6	30	10	28	21	29

1. Length from end of snout to vent (in millimetres). 2. Number of scales across middle of body. 3. Longitudinal series of ventral plates. 4. Transverse series of ventral plates. 5. Plates in collar. 6. Gular scales in a line between symphysis of chin-shields and median collar-plate. 7. Femoral pores (right and left). 8. Lamellar scales under fourth toe.

The three forms may be diagnosed as follows:

Forma typica.—Head about $1\frac{2}{5}$ to $1\frac{1}{2}$ times as long as broad; ventrals in 6 or 8 longitudinal rows; anal moderate or rather small, usually undivided; upper caudal scales oblique; femoral pores 16 to 25.

Var. *anatolica*, Werner.—Head about $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad; ventrals in 8 (rarely 6) longitudinal rows; anal usually divided; upper caudal scales oblique; femoral pores 15 to 21.

Var. *græca*, Bedr.—Head about $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad; ventrals in 6 longitudinal series; anal rather large, undivided; upper caudal scales straight or slightly oblique; femoral pores 20 to 28; frontal often in contact with first supraocular.

To allow these three forms the rank of species would be to impair the sense of proportion in comparison to other species, taken even in

the narrow conception adopted by Méhely, as for instance his *L. saxicola*, in which at least equally important differences in the shape of the head, in the lepidosis, and in the number of femoral pores* are used for the definition of varieties or subspecies only.

Lacerta danfordii is intermediate between *L. lævis* and *L. oxycephala*. From the former it differs chiefly in the absence or vestigial condition of the pterygoid teeth, in the more depressed head, in the absence or faintness of the gular fold, in the absence or small size of the masseteric shield, in the smaller occipital shield in the male, and usually in the absence of keels on the dorsal scales; from the latter in the less pointed snout, in the less flattened head, in the more frequent absence of the masseteric shield, in the longer toes with more numerous lamellæ inferiorly, and in the absence of strongly enlarged subcaudal scales, the latter difference being a very striking one, accompanied by that furnished by the markings on the tail.

25. LACERTA OXYCEPHALA.

Lacerta oxycephala, part., Dum. & Bibr. Erp. Gén. v, p. 235 (1839); Schreib. Herp. Eur. p. 404 (1875).

Lacerta oxycephala, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 276, pl. —, figs. 16, 29; Schreib. Verh. Zool.-bot. Ges. Wien, xli, 1891, p. 579; Tomasini, Wiss. Mitth. Bosn. Herzeg. ii, p. 571 (1894); Werner, Rept. Amph. Oesterr.-Ung. p. 45, pl. ii, fig. 5 (1897), and Wiss. Mitth. Bosn. Herzeg. x, 1907, p. 661; Méhely, Ann. Mus. Hung. vii, 1909, p. 468, pl. xiii, fig. 8, and pl. xv, figs. 6, 7, 9; Schreib. Herp. Eur., ed. 2, p. 383, fig. (1912); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 75, pl. vi, figs. 1, 2.

Lacerta tomasinii, Schreib. Verh. Zool.-bot. Ges. Wien, xli, 1891, p. 580.

Head and body strongly depressed. Head $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its depth, in the tympanic region, equal to the distance between the centre or the posterior corner of the eye and the anterior border of the tympanum; occipital region quite flat or even a little concave; supraocular region rather convex; snout pointed, as long as or a little longer than postocular part of head; cheeks more or less swollen in

* It was at one time believed that *L. anatolica* differs from *L. danfordii* in having fewer femoral pores (15–21 as against 19–26). A more recent statement by Werner (1903) has, however, disposed of this supposed difference, which, even had it been confirmed, could not be allowed much importance, considering the range of variation in species known from a larger material (13–25 in the typical *L. muralis*, 16–24 in *L. lævis* and *L. oxycephala*, 12–24 in *L. dugesii*).

the male; length of pileus 2 to $2\frac{1}{3}$ times its width. Neck at least as broad as head. Hind limb reaching the shoulder or the collar in the male, the elbow or the axil in the female; foot as long as the head in the male, a little longer in the female; toes comparatively short. Tail cylindrical, flattened at the base, about twice as long as head and body.

Nostril between the nasal, two postnasals,* and the first upper labial, the rostral being always excluded. Nasals usually in contact with each other, the median suture often very short; exceptionally † the rostral forms a more or less extensive suture with the frontonasal, which is usually at least as long as broad, but sometimes considerably broader than long; suture between the prefrontals often very short; an azygos shield rarely present between the prefrontals.‡

Frontal $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, as long as its distance from the rostral or from the end of the snout, narrower, behind, than the principal supraoculars, often § in contact with the first supraocular or the several small shields or granules in which it may be disintegrated. Parietals $1\frac{1}{4}$ (young) to $1\frac{2}{3}$ times as long as broad, usually not in contact with upper postocular.|| Occipital always shorter than the interparietal and usually broader, sometimes much broader. The two major supraoculars, which are equal in length or the first slightly the longer, separated from the superciliaries by a complete series of granules, sometimes by two; the fourth supraocular usually in contact with the upper temporal. 6 to 8, rarely 9 superciliaries, the suture between them all vertical or nearly so. Two superposed postnasals; two loreals, first shorter than second. Usually 5, sometimes 6, rarely 4,¶ upper labials anterior to the subocular, the lower border of which is as long as the upper, or a little shorter. Temporal region with small granular scales; masseteric shield large or small, sometimes absent **; tympanic present; a large supratemporal, well visible from above, usually followed by one, two, or three smaller shields.

No pterygoid teeth in the specimens examined.††

* I have come across but one exception, a male from Lissa, in which the postnasal is single on the right side.

† In one specimen from Curzola and in two from Brestica.

‡ In one specimen from Dalmatia (Bedriaga Collection), and in one from Curzola.

§ In 17 cases out of 32.

|| In 48 cases out of 64.

¶ 5 labials in 47 cases, 6 in 12, 4 in 5.

** Large in 32 cases, small in 22, absent in 10.

†† Siebenrock (Sitzb. Ak. Wien, ciii, i, 1894, p. 294) says they are sometimes present.

30 to 42 (usually 33 to 37) scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold very indistinct or totally absent; collar not serrated, composed of 10 to 13 (exceptionally 8 or 6) small or very small plates, which may be scarcely larger than the scales in front of them.

Body covered with small flat, roundish granules, which are a little smaller on the sides than on the back; 59 to 76 (usually 63 to 70) scales across the middle of the body, 3 or 4 (rarely 5) transverse series corresponding to a ventral plate, 31 to 50 in the middle of the back corresponding to the length of the head.

Ventral plates in 6 (rarely 8) longitudinal and 25 to 30 transverse series; the plates of the 6 series sometimes subequal in width, sometimes unequal, those of the median row from the middle line the broadest; when in 8 series the plates of the outer row very narrow.* Preanal plate moderate or rather small, bordered by one, or, more usually, two series of small plates of which a median pair may be more or less enlarged.

Scales on upper surface of tibia obtusely keeled, as large as or a little larger or a little smaller than largest dorsals. 22 to 26 lamellar scales under the fourth toe. 19 to 25 femoral pores on each side†; sometimes a second series of rudimentary pores.‡

Caudal scales truncate, oblique, the upper smooth or more or less strongly but obtusely and diagonally keeled, the lower smooth; the median dorsal pair sometimes a little larger than those adjacent to it, the median ventral pair strongly enlarged, the broadest, in the basal part, at least twice as broad as long; regenerated tail sometimes with a single series of large plate-like scales inferiorly; the whorls longer and shorter alternately; 18 to 30 scales in the fourth or fifth whorl behind the post-anal granules. The sensory apical pits on the caudal scales usually more distinct than in any other species of the *L. muralis* group.

Grey or bluish grey above§ with a dark network enclosing very numerous small roundish light spots, or with small ocellar markings having a tendency to form transverse series; upper surface of head often with symmetrical blackish markings and dark edges to the shields; lower parts greyish white or bluish grey; tail more bluish, with regular black annuli, which are interrupted inferiorly. Young like the adult. Some specimens (var. *atra*, Bedr., *L. tomasinii*, Schreib.) black or blackish brown, with more or less distinct paler

* 8 rows in 5 out of 22 specimens in the British Museum.

† 16 to 24 *fide* Schreiber.

‡ As frequently occurs in *L. muralis*, var. *sardoa*.

§ Sometimes brownish, yellowish, or greenish according to Schreiber.

brown spots,* dark grey or blue beneath. The two type specimens, in the Paris Museum, are entirely black, so that the *L. tomasinii* is really a strict synonym of the typical *L. oxycephala*.

Measurements (in millimetres):

	1.	2.	3.	4.
From end of snout to vent	63	60	62	60
From end of snout to fore limb	28	27	24	25
Length of head	17	15	15	15
Width of head	11	10	9	9
Depth of head	6	6	5	5
Fore limb	24	23	22	22
Hind limb	36	33	33	31
Foot	17	15	15	16
Tail	125	110	—	—

1. ♂, Gacko, Herzegovina. 2. ♂, Curzola. 3. ♀, Dalmatia. 4. ♀, Brestica, Herzegovina.

Particulars of Specimens Examined.

A. Reticulated pattern.

	1.	2.	3.	4.	5.	6.	7.	8.
♂ Zara	60	76	6	28	11	39	22–21	24
„ „	58	63	6	27	10	35	22–21	22
„ Curzola	61	75	8	27	13	38	20–22	26
„ „	60	70	6	29	10	37	22	26
♀ „	50	64	8	29	13	33	21–23	24
„ „	47	63	8	30	10	35	19–20	23
♂ „ **P.M.**	58	73	8	25	13	35	20	24
♀ „ **L.M.**	61	72	6	29	11	39	25–23	24
♂ Lissa	61	66	6	27	11	33	21–20	25
„ „	57	69	6	26	11	39	19–20	25
„ „	56	71	6	25	12	34	19	23
„ Gelsa, Lesina	58	70	6	26	10	33	19–20	22
♀ „ „	49	71	6	27	12	30	19–21	23
„ Dalmatia	62	60	8	28	11	37	20–22	24
♂ Bilak, Herzegovina	62	68	6	26	13	33	23–19	25
„ Korito „	61	64	6	28	13	31	20–19	24
♀ Trebinje „	59	65	6	28	8	34	21	26

* After some time in spirit these light spots become more distinct, and certain preserved specimens may be said to be absolutely intermediate between the two principal types of coloration. Werner (1907) alludes to specimens from a great altitude in Herzegovina as only "ziemlich dunkel." The supposed structural differences between these two forms, pointed out by Méhely, have no existence in fact.

B. Uniform black or blackish.

	1.	2.	3.	4.	5.	6.	7.	8.
♀ Dalmatia (type), **P.M.**	54	70	6	28	11	34	21	25
„ „ „ „	44	76	6	29	10	36	20	24
♂ Brestica, Herzegovina	64	66	6	27	10	31	19	23
♀ „ „	60	62	6	30	6	34	19–20	24
„ „ „	59	60	6	28	11	36	22–21	24
♂ Gacko „	63	61	8	26	12	33	20	23
„ Baba Planina, Herzegovina	67	64	6	29	11	36	23–22	25
„ „ „	64	60	6	26	10	32	19–21	24
„ „ „	61	74	6	25	13	35	21	23
„ „ „	53	65	8	27	11	42	22–23	26
♀ „ „	61	75	6	29	12	36	21–20	25
„ „ „	54	66	6	30	12	31	21	24
„ „ „	52	68	6	28	11	34	20–21	25
„ Cettinje, Montenegro	61	70	6	28	13	37	20–22	25

Columns as on p. 318.

Habitat.—Dalmatia, Herzegovina, Montenegro, and neighbouring islands; the reticulated form from sea-level to 1000 m. altitude, the black form from 500 to 1400 m.

Distinguished from *L. muralis* by the two postnasals, the much enlarged basal subcaudal scales, and the frequent separation of the prefrontal from the second supraocular, this lizard bears considerable resemblance to *L. muralis*, var. *bedriagæ*, but I regard this as a case of convergence, such as we know, within the limits of the species *L. muralis*, in the vars. *monticola*, *horvathi*, and *saxicola*. The real affinities are with *L. danfordii*, and both species were probably derived from the same ancestor.

26. LACERTA MOSORENSIS.

Lacerta mosorensis, Kolombatović, Imen. Kralj. Dalmac. ii, p. 26 (1886); Schreib. Verh. Zool.-bot. Ges. Wien, xli, 1891, p. 574; Steind. Ann. Hofmus. Wien, vii, 1892, p. 235, pl. xvi; Werner, Rept. Amph. Oesterr.-Ung. p. 46 (1897); Méhely, Ann. Mus. Hung. ii, 1904, p. 364, figs., and vii, 1909, p. 592, pl. xxiv, figs. 5–7, and pl. xxv, figs. 1–5; Schreib. Herp. Eur., ed. 2, p. 398, fig. (1912); Bouleng. Tr. Zool. Soc. xxi, 1916, p. 78, pl. vi, figs. 3–5.

Lacerta koritana, Tomasini, Glasn. zem. muz. Bosn. Herzeg. i, 1889, p. 51, and Wiss. Mitth. Bosn. Herzeg. ii, p. 575 (1894).

Head and body much depressed, as in *L. oxycephala*. Head $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its depth, in the tympanic region, equal to the distance between the centre or the posterior corner of the eye and the anterior border of the tympanum; snout pointed, as long as postocular part of head; cheeks moderately swollen in the male; length of pileus 2 to $2\frac{1}{4}$ times its width. Neck at least as broad as head. Hind limb reaching the axil or the shoulder in the male, the wrist or the elbow in the female; foot as long as or a little longer than the head. Tail cylindrical, flattened and with a median dorsal groove at the base, $1\frac{1}{2}$ to a little over 2 times as long as head and body.

Nostril between the nasal, one or two postnasals, and the first upper labial, the rostral being always excluded. Nasals separated from each other, the rostral forming a more or less extensive suture with the frontonasal*; prefrontals forming a median suture. Frontal usually as long as its distance from the rostral, sometimes a little longer or a little shorter, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, usually broader, behind, than the supraoculars. Parietals $1\frac{1}{4}$ (young) to $1\frac{3}{4}$ times as long as broad, not in contact with the upper postocular. Occipital much shorter than and as broad as or a little broader than the interparietal. The two major supraoculars, which are equal in length or the first slightly the longer, separated from the superciliaries by a usually complete series of granules†; first supraocular small, never in contact with the frontal; fourth also small and in contact with the anterior supratemporal.‡ 6 or 7, rarely 8§ superciliaries, first largest, the suture between first and second usually vertical, rarely oblique. Usually two superposed postnasals‖; anterior loreal sometimes as long as second, usually shorter. As often 4 as 5 upper labials anterior to the subocular,¶ the lower border of which is not or but slightly shorter than the upper. Temporal region with small or rather large granular scales; masseteric shield usually large, oval or elliptic, rarely small; tympanic present; a large supratemporal, well visible from above, usually followed by one or two smaller shields.

* There are, however, rare exceptions, according to Schreiber.

† According to Schreiber the series may sometimes be reduced to a few granules. I have myself seen a specimen (Dalmatia, Bedriaga collection) with only 4 granules on one side and 5 on the other.

‡ "Fast immer," *fide* Schreiber.

§ Or 5, according to Méhely.

‖ Schreiber, who has examined more than 60 specimens, regards a single postnasal as very exceptional, and I also find 2 postnasals in the 4 specimens from Baba Planina. It is therefore remarkable that out of 12 specimens from the Biokovo Mt. received from Prof. Kolombatović, 5 have a single postnasal.

¶ Out of 32 cases, I find 18 with 4 labials and 14 with 5. Méhely finds usually 5, often 4, rarely 6.

No pterygoid teeth in the few specimens examined.

23 to 30 (usually 25 to 27) scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate : gular fold very indistinct or totally absent; collar not serrated, composed of 7 to 10 plates (usually 9), which may be very small.

Body covered with large flat, round, subtetragonal or subhexagonal, smooth or faintly keeled granules, which are larger, often much larger, on the back than on the sides; 36 to 42 scales across the middle of the body,* 2 and 3 or 3 and 4 transverse series corresponding to a ventral plate, 22 to 29 in the middle of the back corresponding to the length of the head. Ventral plates in 6 longitudinal and 25 to 29 transverse series; the plates of the second row from the middle line usually the broadest. Preanal plate rather large, sometimes preceded by a smaller plate or a pair of smaller plates, and bordered by one or two semicircles of scales or small plates.

Scales on upper surface of tibia rhombic, rough, tubercular or strongly keeled, as large as or a little smaller or a little larger than largest dorsals. 22 to 25 lamellar scales under the fourth toe. 16 to 20 femoral pores on each side.†

Caudal scales rather broad, truncate, oblique, the upper rather strongly but obtusely keeled, the lower smooth, the median pair, above and beneath, mostly broader than the others; the whorls, markedly longer and shorter alternately, well detached at the sides, forming a serrated outline; 18 to 24 scales in the fourth or fifth whorl behind the postanal granules.

Grey, brown, or olive above,‡ usually a little darker on the sides than on the back, uniform or with black spots or reticulations all over or restricted to the sides or to the sides and the vertebral region; no dark vertebral line or series of spots; the black spots on the sides sometimes so crowded as to constitute the ground-colour, the true ground-colour appearing as small light spots. Spots on the tail, if present, often forming cross-bars, but never such regular annuli as in *L. oxycephala*; in addition to these bars, sometimes a median series of spots. Pale yellow or greenish yellow beneath,§ without dark spots; blue spots may be present on the outer ventrals.

Young uniform or with small dark and light spots.

* Up to 45, *fide* Méhely.

† Up to 25, *fide* Méhely.

‡ Sometimes yellow or almost grass-green, according to Tomasini.

§ Sometimes orange according to Tomasini, or pearl-grey or blue according to Méhely.

Measurements (in millimetres):

	1.	2.	3.	4.
From end of snout to vent	67	55	68	62
„ „ „ fore limb	27	21	23	25
Length of head	16	14	15	16
Width of head	11	9	10	11
Depth of head	6	6	6	6
Fore limb	25	20	20	23
Hind limb	36	29	29	35
Foot	18	16	15	17
Tail	—	105	—	130

1, 2. ♂, Biokovo Mt. 3. ♀, Biokovo Mt. 4. ♂, Coputne Rundine.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Biokovo Mt., Dalmatia	67	36	25	9	27	20	23
„ „ „	60	40	25	9	23	19–18	24
„ „ „	55	41	26	7	29	19–18	24
„ „ „	55	39	25	8	26	17–19	23
„ „ „	51	40	26	10	26	16	23
♀ „ „	68	42	25	9	27	16	24
„ „ „	67	40	27	9	27	18	24
„ „ „	64	42	27	10	30	18–19	25
„ „ „	64	39	26	9	25	17–18	23
„ Dalmatia	63	40	28	9	24	17–19	23
♂ Baba Planina, Herzegovina	68	41	25	9	24	20	23
„ „ „	68	38	26	9	24	17	23
„ „ „	66	41	25	8	27	18–19	?
♀ „ „	64	37	29	8	23	18–16	23
♂ Coputne Rundine, Montenegro	62	42	25	9	25	16–17	22

1. Length from snout to vent (in millim.). 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Plates in collar. 5. Gular scales in a straight line between symphysis of chin-shields and median collar-plate. 6. Femoral pores (right and left). 7. Lamellar scales under fourth toe.

Habitat.—Mountains of Dalmatia, Herzegovina, and Montenegro, between 700 and 1400 m. altitude.

Lacerta mosorensis, in general appearance, occupies an intermediate position between *L. muralis* (especially such mountain forms as var. *monticola*, *horvathi*, and *chalybdea*) and *L. oxycephala*. Well distinguished among all other species by the large rugose scales on the

upper surface of the tibia, and from the two above-named by the larger dorsal scales compared to the laterals. Its real affinities are doubtful, and it may well be that its resemblance to *L. oxycephala* is a case of parallelism, both species being independently derived from some more generalised type akin to *L. brandtii*.

27. LACERTA DUGESII.

Lacerta dugesii, M.-Edw. Ann. Sc. Nat. xvi, 1829, pp. 71 and 84; Dum. & Bibr. Erp. Gén. v, p. 236 (1839); Godman, Nat. Hist. Azores, p. 43 (1870); Bedriaga, Arch. f. Nat. 1879, p. 330, and Abh. Senck. Ges. xiv, 1886, p. 308; Bouleng. Cat. Liz. iii, p. 35 (1887), and Tr. Zool. Soc. xxi, 1916, p. 81, pl. vii.

Teira punctata, Gray, Ann. N.H. i, 1838, p. 280, and Cat. Liz. p. 33 (1845).

Lacerta maderensis, Girard, U.S. Explor. Exped., Herp. p. 200, pl. xxiv, figs. 1–8 (1858).

Lacerta punctata, Bouleng. Proc. Zool. Soc. 1881, p. 743.

Form and general proportions much as in the typical *L. muralis*. Head $1\frac{1}{3}$ to $1\frac{3}{5}$ times as long as broad, its depth, in the tympanic region, equal to the distance between the anterior corner or the centre of the eye and the anterior border of the tympanum; snout pointed,* rarely rather obtuse, as long as postocular part of head; cheeks more or less swollen in the male; length of pileus $1\frac{4}{5}$ to 2 times its width. Neck at least as broad as head; body rather strongly depressed. Hind limb reaching the axil, the shoulder, or the collar in the male, the wrist or the axil in the female. Foot usually longer than the head, as long as the head in very large specimens. Tail cylindrical or depressed at the base (elliptic in section), $1\frac{1}{2}$ to 2 times as long as head and body.

Nostril between the nasal, the postnasals, and the first upper labial; rostral nearly always excluded.† Nasals forming a median suture; prefrontals forming an extensive median suture, unless (very rarely) separated by an azygos shield. Frontal as long as or a little shorter than its distance from the rostral, $1\frac{1}{6}$ to $1\frac{2}{3}$ times as long as broad, not or but little narrower behind than in front, broader throughout than the supraoculars. Parietals $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, in contact with the upper postocular, outer border straight or convex. Occipital‡

* Particularly in specimens from Porto Santo.

† Exception in one half-grown specimen from Paul, Madeira.

‡ The occipital is absent in one of the type specimens described by Milne-Edwards; an individual anomaly, as pointed out by Bedriaga.

as long as or shorter than and as broad as or broader than the interparietal, sometimes twice as broad as the latter and as broad as the frontal. The two major supraoculars, of which the first is nearly always the longer, separated from the superciliaries by a complete series of granules; first supraocular small, sometimes broken up into two, never in contact with the frontal; fourth also small and sometimes broken up into two. 6 or 7 superciliaries, first largest, the suture between first and second as often oblique as vertical.

Two superposed postnasals; 2 loreals, first shorter than second. A rather large semitransparent area in the lower eyelid, with 5 or 6 vertically elongate shields. 5 (rarely 4) upper labials anterior to the subocular, the lower border of which is often not or but slightly shorter than the upper, although liable to as much variation of form as in the typical *L. muralis*. Temporal region covered with granules, or granules and irregular small shields; masseteric shield absent* tympanic present, sometimes preceded by a second, similar shield; upper temporal absent.

No pterygoid teeth.†

25 to 38 (usually 28 to 32) scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold distinct; collar not serrated, composed of 7 to 13 plates (usually 9 to 11).

Scales on body granular, round or suboval, smooth or very faintly keeled, a little larger on the sides than on the back, 54 to 81 (usually 60 to 70) across middle of body, 3 or 4 transverse series corresponding to a ventral plate, 37 to 60 in the middle of the back corresponding to the length of the head. Ventral plates in 6 (very rarely 8‡) longitudinal and 24 to 31 transverse series (24 to 28 in ♂, 25 to 31 in ♀); the plates of the two median series narrower, often much narrower, than those next to them. Preanal plate usually large, but variable in size, bordered by one or two semicircles of small plates.

Scales on upper surface of tibia granular, smooth, usually smaller than those on the back, rarely nearly as large. 25 to 33 lamellar scales under the fourth toe. 16 to 24 femoral pores on each side (12 to 19 in specimens from Great Salvage).

Caudal scales narrow, truncate or very obtusely pointed, the upper obtusely or rather strongly keeled, the lower usually feebly keeled, the keels straight; the whorls markedly longer and shorter alternately;

* Present in a male from Graciosa, Azores.

† Sometimes present according to Bedriaga.

‡ In a female from Madeira (Macgillivray) and in another from Paul; these outer plates very small, but as long as the adjacent plates.

34 to 40 scales in the fourth or fifth whorl behind the postanal granules.

Ground-colour grey, brown, or green, or dark brown or blackish speckled with yellowish or green; a pair of light bands, sometimes dark-edged, from behind the superciliary edge to the base of the tail, constantly present in the young, is usually retained by the females; sides often with a black or dark brown band with or without light dots. Upper surface of head with small dark spots or vermiculations. Markings on the tail similar to those on the body; no cross-bars.

Lower parts yellow, orange, or red, usually uniform, sometimes with black dots; throat sometimes blue in males, sharply contrasting with the red belly; no blue on the outer ventral plates.

The British Museum collection contains a totally black specimen (♀) from Madeira. A male from Bugio, S. Desertas, is nearly black above with traces of lighter markings, and the belly is black with whitish variegations.

Measurements (in millimetres):

	1.	2.	3.	4.	5.	6.
From end of snout to vent	80*	80	74	64	70	58
„ „ „ fore limb	33	31	30	24	27	23
Length of head	21	17	17	15	17	14
Width of head	15	12	13	9	11	9
Depth of head	10	9	9	8	9	7·5
Fore limb	28	25	29	21	25	20
Hind limb	39	37	39	32	36	28
Foot	21	19	21	17	18	15
Tail	—	—	135	108	115	—

1. ♂, Paul, Madeira. 2. ♀, Paul. 3. ♂, Madeira. 4. ♀, Madeira. 5. ♂, Great Salvage. 6. ♀, Great Salvage.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7
♂ Madeira (type), P.M.	66	63	26	10	35	23–24	28
„ „ („) „	64	69	26	9	31	20–22	30
„ „ (type of *T. punctata*)	65	60	25	10	31	20	30
„ „ (Parry)	68	72	28	10	35	18–20	31
„ „ („)	64	69	26	12	31	18–21	29

* The left hind limb of this specimen is mutilated and from the stump of tibia left a new growth has sprung out which in form and scaling resembles the tail of a lizard, tapering to a fine point and clad with whorls of keeled scales. A somewhat similar outgrowth has been described and figured by Brindley (1898) in *L. muralis*.

		1.	2.	3.	4.	5.	6.	7.
♀	Madeira (Parry)	64	61	26	11	28	20	29
♂	„ (Christy)	74	60	27	12	26	21–19	27
„	„ „	66	70	26	11	32	20–22	30
„	„ „	64	66	28	10	34	20–19	29
♀	„ „	70	70	27	10	33	19–21	29
♂	„ (Macgillivray)	62	69	25	9	31	18–16	28
„	„ („)	60	73	24	11	28	20–19	29
♀	„ („)	65	70	27	10	32	21	30
♂	„ (Grant)	70	66	26	9	33	20–19	28
„	„ („)	63	69	26	10	32	22–21	31
„	„ (Nicoll)	65	81	26	12	31	19	30
„	„ („)	63	64	24	10	31	18	28
„	„ („)	59	69	27	12	35	19	31
♀	„ („)	58	66	27	11	29	22–21	31
„	„ („)	54	65	27	10	33	19	31
„	„ („)	54	73	29	9	37	16	32
♂	„	72	65	27	9	29	23	27
„	„	65	72	25	10	34	24	33
„	„	65	70	26	12	37	21	29
♀	„	59	76	29	12	38	19	29
♂	Funchal, Madeira	78	67	26	11	33	23	31
♀	„ „	65	65	28	7	28	22–21	29
„	„ „	65	66	28	12	31	20	28
♂	Paul, Madeira	80	75	27	8	35	23–21	29
„	„ „	70	65	26	9	31	20	31
♀	„ „	80	64	29	9	32	20	29
„	„ „	75	65	27	10	36	21–19	32
„	„ „	69	67	29	12	32	18	29
„	„ „	65	66	27	10	32	20	30
♂	Great Piton	58	65	25	10	28	19–20	28
♀	„	57	55	27	10	28	17–16	28
„	„	48	56	25	11	26	16–19	26
♂	Porto Santo	67	63	25	10	29	19	28
„	„	65	68	25	11	30	18–17	29
„	„	61	65	26	10	32	20–18	28
„	Deserta Grande	65	71	26	10	35	22–21	30
„	„	58	65	26	11	30	19–18	29
„	Bugio, S. Deserta	68	66	25	11	34	21–20	27
„	Great Salvage	70	63	25	13	31	19–18	25
„	„	63	54	24	10	26	15	27
♀	„	58	61	27	11	28	13–12	26

	1.	2.	3.	4.	5.	6.	7.
♀ Great Salvage	58	58	26	11	25	13–12	25
„ „	54	55	27	9	28	13	27
♂ Graciosa, Azores . . .	72	66	27	12	30	22–19	29
„ „ „ . . .	70	65	25	11	29	19	29
„ „ „ . . .	70	62	27	10	28	20–23	26
„ „ „ . . .	66	71	26	11	28	20–19	33
♀ „ „ . . .	64	64	28	10	30	22	26
„ „ „ . . .	63	63	27	11	30	17	28
„ „ „ . . .	62	60	29	9	28	19–20	29
„ „ „ . . .	59	61	31	9	32	18–17	29
„ Orotava, Teneriffe . . .	59	57	26	11	26	18	26

Columns as on p. 326.

Habitat.—Madeira, Porto Santo, and neighbouring islets; also found in the Azores, on the island of Graciosa, where it is said to have been introduced in the last century. Duméril and Bibron reported this lizard from Teneriffe and a young specimen was obtained on that island by the Challenger Expedition; the British Museum possesses besides a specimen stated to be from Orotava.

Although not unlike *L. dandordii* in many respects, I do not think this species bears any special affinity to this and other Oriental forms with two postnasals; it stands nearer *L. muralis*, from which it is well distinguished by the constant presence of two postnasals combined with the absence of masseteric and upper temporal shields. In the absence of a dark vertebral stripe or series of spots it agrees with *L. muralis*, vars. *vaucheri* and *bocagii*, which are the continental forms geographically nearest to it (Spanish Peninsula and North-West Africa), and a direct derivation from the common ancestor of these forms is highly probable.

Section V. Centromastix, Blgr.—Ventral plates overlapping and notched between the longitudinal series, which are 6 in number; a single postnasal; some of the caudal scales produced into raised spines. Pterygoid toothless. A single species.

28. LACERTA ECHINATA.

Lacerta (*Zootoca*) *echinata*, Cope, Proc. Ac. Philad. 1862, p. 189.

Lacerta hirticauda, Vaillant, Bull. Soc. Philom. (7), viii, 1884, p. 168, and Bull. Soc. Zool. France, ix, 1885, p. 344, pl. xii, fig. 1.

Lacerta echinata, Bouleng. Zool. Rec., Rept. xxi, p. 10 (1885); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 385; Bouleng. Cat. Liz. iii.

p. 11 (1887); Tornier, Zool. Jahrb., Syst. xv, 1902, p. 674; L. Müll. Abh. Bayer. Ak. xxiv, iii, 1910, p. 559.

Lacerta langi, Schmidt, Bull. Amer. Mus. N.H. xxxix, 1919, p. 492, fig., pl. xxi.

Body depressed. Head much depressed, flat above, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its depth equal to the distance between the centre or the posterior border of the eye and the tympanum, its length $3\frac{1}{2}$ to 4 times in length to vent in males, 4 to $4\frac{1}{3}$ times in females; snout obtusely acuminate, as long as postocular part of head or a little shorter; no parietal foramen. Neck narrower than head. The hind limb reaches the elbow or the axil in males, the elbow in females; foot as long as head or a little longer; digits slender, compressed distally. Tail cylindrical, except at a short distance from its base, where it is swollen and often even a little depressed, then tapering again towards the end; its length $2\frac{1}{3}$ to 3 times that of head and body.

Nostril pierced between three or four shields. Rostral in most specimens entering the nostril, in others not; nasals small, forming a short suture behind the rostral; frontonasal as long as broad or a little longer, broader than the internarial space; prefrontals forming a more or less extensive suture or separated by a small azygos shield*; frontal pentagonal or hexagonal, $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, as long as or shorter than its distance from the end of the snout, as broad as or a little broader than the supraoculars, not or but scarcely broader in front than behind, sometimes trilobate in front†; parietals $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, sometimes forming a suture on the median line behind the frontoparietals, outer border straight or convex and as often as not in contact with the upper postocular; interparietal usually narrow, sometimes divided into two, or much reduced, or absent; occipital rather large, trapezoid or triangular, sometimes as broad as the frontal. Four supraoculars, first small and sometimes fused with the first superciliary, second and third equal, fourth small; 6 or 7 superciliaries; granules between the supraoculars and the superciliaries absent, or 1 to 3 in number. A single postnasal, in contact with the frontonasal; anterior loreal shorter than the second; 4, less frequently 5‡ upper labials anterior to the subocular, which is not or but little narrower beneath than above. Temple covered with uniform small, obtusely keeled, granular scales.

* In a male from the Ivory Coast.

† In the type of *L. hirticauda*.

‡ 5 in the type, according to Cope, and in a female in the Paris Museum (Ivory Coast); on one side in three of the specimens in the British Museum, and in one in the Paris Museum (French Congo).

No pterygoid teeth.

Gular scales granular, smooth or faintly keeled, larger, flat, and smooth towards the collar, 22 to 43 between the symphysis of the chin-shields and the median collar-plate; no gular fold. Collar serrated, composed of 6 to 9 plates.

Scales on nape granular and feebly keeled, on back rather large, rhombic, obtusely and diagonally keeled; lateral scales rather smaller, more or less distinctly keeled down to the ventrals; interstitial granules much developed; 32 to 45 scales across middle of body*; 25 to 33 transverse series, in the middle of the back, correspond to the length of the head; 2 or 3 transverse series, on the side, correspond to a ventral plate. Ventral plates overlapping, with notches between their posterior borders, in 6, rarely 8,† longitudinal series, the plates of the second series from the median line a little broader than the others, and 27 to 31 transverse series. Preanal shield moderate or rather small, bordered by a semicircle of 6 to 8 smaller shields; a second semicircle sometimes present.

Scales on upper surface of tibia keeled, as large as or a little smaller than dorsals. 10 to 14 femoral pores on each side.‡ 26 to 32 lamellar scales under the fourth toe.

Caudal scales strongly keeled, pointed behind, in more or less distinctly longer and shorter whorls alternately, 22 to 26 in the fourth or fifth whorl behind the postanal granules; from the 14th or 15th whorl, and on 14 to 20 whorls, the scales become much broader, forming 6 or 8 longitudinal dorsal series, thicker, rugose, and more or less distinctly serrated on the posterior border, mucronate, more strongly keeled, and raised posteriorly, forming spines directed upwards and backwards.

Some specimens are green above, uniform or with a few black spots on the posterior part of the back, or with black vermiculations on the sides of the head, neck, and anterior part of body. Others are green with a wide-meshed black network. Others are olive with 16 to 20 transverse series of round pale green black-edged ocellar spots (from occiput to base of tail) each consisting of 10 or 12 spots, which may run together and form cross-bars which, on the neck, or also on the anterior part of the body, may be separated by black bars of equal width or narrower. Head green or olive above, uniform or spotted with black, the temples often with black vertical bars. Two specimens

* 46 in the type of *L. langi*.

† Female from the Ivory Coast (Paris Museum). These additional plates are keeled.

‡ 9 in the type of *L. langi*.

from the Ivory Coast, in the Paris Museum, have the back barred with black and pale green or yellowish white. Fore limbs sometimes with black cross-bars, hind limbs usually with round light spots. Lower parts green, without spots, throat often yellow; sometimes entirely yellowish.* Tail olive or brown above, with lighter or darker spots or cross-bars, uniform green beneath.

Measurements (in millimetres):

	♂	♀
From end of snout to vent	85	92
,, ,, ,, fore limb	36	35
Length of head	23	22
Width of head	14	13
Depth of head	11	11
Fore limb	33	34
Hind limb	43	44
Foot	24	24
Tail	210	230

Particulars of Specimens Examined.

	1	2.	3.	4.	5.	6.	7.	8.
♂ Gold Coast	84	42	30	8	36	10–11	28	2
,, Assini, Gold Coast (type of *L. hirticauda*), **P.M.**	99	37	31	8	32	12	31	2
,, Ivory Coast, **P.M.**	90	40	30	9	33	11–14	30	3–2
♀ ,, ,, ,,	84	32	31	8	30	11–10	26	1
,, Cameroon	100	37	28	8	43	12	32	0
,, Kribi R., S. Cameroon	90	35	29	7	26	11–12	27	3
♂ Bitye ,,	90	43	27	7	30	12	30	3
,, ,, ,,	85	38	29	8	31	11	29	3
♀ ,, ,,	95	39	28	7	27	11–12	30	3
,, ,, ,,	92	37	31	7	29	11	30	3
,, Benito R.	90	34	30	7	22	10	27	2–1
,, French Congo, **P.M.**	85	45	30	9	33	11	28	0
,, ,, ,, ,,	82	45	29	6	29	11–12	26	3
♂ Loango	88	34	28	7	28	12–11	29	1–0
,, W. Africa	76	38	30	8	35	13–12	29	0

Column 8 refers to the granules between the supraoculars and the superciliaries. Otherwise as on p. 326.

* From the notes of the collector, quoted by Tornier, the ventral plates of a specimen from Cameroon were yellow in life, edged with pale blue.

Habitat.—From West Africa (Liberia, Gold Coast, Cameroon, Spanish Guinea, and Mouth of the Loango) to the Ituri (*L. langi*, Schmidt).

This species occupies an isolated position. Were it not for the more primitive condition of the ventral plates, it might be thought to be derived from the *L. muralis* group, especially as it shows points of agreement with *L. jacksonii* in the strongly depressed head, the dorsal scales, and the absence of the parietal foramen; it also agrees with it in having a single postfrontal bone. The occasional absence of the interparietal shield, in connexion with the loss of the parietal foramen, is an anomaly more frequent still in *Philochortus spinalis*.

Section VI. Thetia, Gray.—Ventral plates not overlapping, the transverse series with rectilinear border, in 10 or 12 longitudinal series; two superposed postnasals; lower eyelid with a transparent disc. Pterygoids toothless.

A single species.

29. LACERTA PERSPICILLATA.

Lacerta perspicillata, Dum. & Bibr. Erp. Gén. v, p. 249 (1839) Guichen. Explor. Sc. Alg., Rept. p. 12, pl. i, fig. 3 (1850); Strauch, Erp. Alg. p. 34 (1862); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 295; Boulenq. Cat. Liz. iii, p. 43 (1887), and Tr. Zool. Soc. xiii, 1891, p. 126; Anders. Proc. Zool. Soc. 1892, p. 13; Doumergue, Erp. Oran. p. 127, pl. viii, figs. 9, 10 (1901); Chabanaud, Bull. Mus. Paris, 1916, p. 231.

Thetia perspicillata, Gray, Cat. Liz. p. 32 (1845).

Body depressed. Head rather strongly depressed, $1\frac{2}{5}$ to $1\frac{3}{5}$ times as long as broad, its depth equal to the distance between the centre or the posterior border of the eye and the tympanum, its length $3\frac{1}{2}$ to 4 times in length to vent in males, 4 to 5 times in females; snout pointed, a little shorter than the postocular part of the head. Pileus 2 to $2\frac{1}{4}$ times as long as broad. Neck as broad as the head or a little broader. The hind limb reaches the shoulder or a little beyond in males, the wrist, the elbow, or the axil in females; foot as long as or a little longer than head; digits slender, compressed. Tail cylindrical, $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as head and body.

Nostril separated from the labial and the postnasals by a narrow rim, also from the rostral; nasals forming a short suture; fronto-nasal usually broader than long,* much broader than the internarial

* Sometimes in contact with the frontal, according to Doumergue.

space; frontal pentagonal or hexagonal, $1\frac{1}{2}$ to 2 times as long as broad, as long as its distance from the nasals, narrower than the supraoculars*; parietals $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, rarely in contact with the upper postocular, outer border straight or slightly convex and in contact with 5 to 9 upper temporals, of which the first may be narrow and elongate. Occipital shorter and often a little broader than the interparietal.† Four supraoculars, first and fourth smaller but rather large, sometimes divided into two, the fourth often twice as broad as long; 5 to 7 superciliaries, suture between the first and second oblique; a series of 6 to 10 rather large granules between the supraoculars and the superciliaries, from the first to the fourth supraocular, rarely incomplete and reduced to 5. Two superposed postnasals, the upper on the upper surface of the snout; anterior loreal much shorter than second; 5 or 6, rarely 7‡ upper labials anterior to the subocular, the lower border of which is much shorter than the upper. Lower eyelid with a transparent disc. Temple covered with small granular scales, only the upper, bordering the parietal, being more or less enlarged; a well-developed tympanic shield.

No pterygoid teeth.

Gular scales granular, larger towards the collar, 28 to 36 between the symphysis of the chin-shields and the median collar-plate; a more or less distinct gular fold. Collar straight-edged, with 7 to 10, exceptionally 5, 6, or 12 plates, which on the sides merge gradually into the granules on the sides of the neck.§

Scales on body very small and granular, smooth or faintly keeled, 50 to 66 in a transverse series, 37 to 50 transverse series, in the middle of the back, corresponding to the length of the head, 3, or 3 or 4, on the sides corresponding to a ventral plate. Ventral plates with rectilinear borders, in 10, rarely 12, longitudinal series, equal, or those of the second series from the median line a little broader, the outer series often bordered by an incomplete series of smaller plates; 29 to 32 transverse series in males, 31 to 36 in females. Preanal plate moderately large or rather small, bordered by two semicircles of smaller plates, the inner formed of 5, 6, or 7.

Scales on upper surface of tibia smooth, as large as or a little smaller

* Narrower and longer in the young.

† In two specimens (Lataste Collection) the interparietal and occipital are fused.

‡ 6 on both sides in 7 specimens, on one side in 5; 7 on one side in a specimen from Oran in the Paris Museum.

§ The counting of the collar-plates is therefore difficult and often somewhat arbitrary.

than dorsals. 16 to 21 femoral pores on each side.* 22 to 26 lamellar scales under the fourth toe.

Caudal scales smooth, truncate, in alternately longer and shorter whorls, with more or less distinct apical pits; 28 to 32 scales in the fourth or fifth whorl behind the postanal granules.

This species presents a marked dimorphism of coloration, some specimens being uniform greyish or brownish olive or olive or bluish green with bronzy gloss, others being reticulated with black or elegantly marked all over with greenish white or yellow, black-edged ocelli (var. *guichenoti*, Doumergue). In the reticulated or ocellated specimens the upper surface of the head is reticulated or spotted with black. Tail sometimes bluish. Lower parts white or bluish or greenish, unspotted.

Measurements (in millimetres):

	♂	♂	♀	♀
From end of snout to vent	58	45	53	46
„ „ „ fore limb	24	18	19	18
Length of head	14	13	11	11
Width of head	10	8	8	7
Depth of head	7	6	6	5
Fore limb	19	17	17	16
Hind limb	29	23	24	24
Foot	16	13	13	12
Tail	—	75	—	63

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Sta. Cruz (Anderson)	51	58	29	9	30	19–18	24
„ „ „	47	60	30	7	34	18	26
„ „ (Lataste)	50	57	31	8	32	19–20	24
„ „ „	49	55	31	10	31	18–19	25
♀ „ „	50	50	31	7	31	18–19	24
„ „ „	48	56	33	10	30	18–19	25
„ „ „	43	51	34	6	31	20	23
♂ Oran, P.M.	48	64	30	7	34	21–20	26
♀ „ „	34	63	35	7	36	17–18	26
♂ „ (Doumergue)	50	60	30	10	28	19–21	23
„ „ „	48	54	32	10	29	17–18	22
„ „ „	45	58	30	8	33	19–18	23
♀ „ „	46	60	32	9	34	18	25

* 13, as given by Duméril and Bibron, is no doubt due to a lapsus or a misprint.

	1.	2.	3.	4.	5.	6.	7.
♀ Oran (Doumergue) . . .	43	55	34	5	32	16–17	26
,, ,, (Rothschild) . . .	47	55	34	9	32	18	26
♂ Algeria	58	54	29	10	32	19	24
♀ ,, ...	53	56	35	6	32	20	25
Yg. ,, (type), **P.M.** . .	25	60	29	6	31	20	23
♂ Teluet, Morocco, **P.M.** . .	50	65	30	11	31	19	25
,, ,, ,, ,, . .	45	61	32	10	28	19	26
,, ,, ,, ,, . .	43	64	32	9	30	20–19	25
♀ ,, ,, ,, . .	56	62	36	9	34	19–18	26
,, ,, ,, ,, . .	56	64	34	10	31	19–20	23
,, ,, ,, ,, . .	53	66	35	12	30	21	23

1. Length from snout to vent (in millim.). 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of plates in collar. 5. Number of gular scales in longitudinal series. 6. Number of femoral pores (right and left). 7. Number of lamellar scales under fourth toe.

Habitat.—Of all species of *Lacerta*, known from more than a few specimens, this was long believed to have the most restricted habitat, having been found only in the town of Oran and its vicinity. It has, however, recently been recorded from Teluet, on the Atlas near the city of Morocco, by Chabanaud.

Although quite isolated in the genus *Lacerta* this species is probably derived from the Section *Podarcis*; by appealing to the genus *Eremias* (Section *Mesalina*) we can easily imagine the missing links—enlargement of the central scales of the lower eyelid accompanied by greater and greater translucidity and ultimate fusion of the same, division of the ventral plates resulting in an increase in the number of longitudinal series. As usual in the Section *Podarcis*, the two postfrontal bones are distinct.

3. ALGIROIDES.

Algiroides, Bibron, in Bory de St. Vinc. Expéd. Sc. Morée, Rept. p. 67 (1835); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 391; Bouleng. Cat. Liz. iii, p. 43 (1887); Schreib. Herp. Eur., ed. 2, p. 367 (1912).

Notopholis, part., Wiegm. Herp. Mex. p. 10 (1834).

Lacerta, part., Dum. & Bibr. Erp. Gén. v, p. 174 (1839).

Notopholis, Gray, Cat. Liz. p. 34 (1845); Schreib. Herp. Eur. p. 448 (1875).

Algira, part., Lataste, Ann. Mus. Genova (2), ii, 1885, p. 125.

Adolfus, Sternf. in Schubotz, Wiss. Ergebn. Deutsch. Z.-Afr. Exped. iv, ii, p. 220 (1912).

Head-shields normal. Nostril pierced between two or three nasals, in contact with or narrowly separated from the first upper labial. Lower eyelid scaly. Collar well marked. Dorsal scales large, imbricate, strongly keeled; ventrals squarish, not or but feebly imbricate, smooth. Digits feebly compressed, with smooth or tubercular lamellæ inferiorly. Femoral pores. Tail long, cylindrical.

Southern Europe, Tropical Africa.

This genus is very closely allied to *Lacerta*, differing only in the large, imbricate dorsal scales, a state of things foreshadowed by *L. princeps* and *L. atlantica*. Although constituting, in a sense, a link between *Lacerta* and *Psammodromus*, none of the known species can be looked upon as suggesting a phylogenetic connexion between any of the members of these genera.

The European species form a group distinct from the African, but the close affinity which *A. africanus* appears to bear to *A. nigropunctatus* indicates a common origin, probably in S.W. Asia, whence, however, no representative of the genus is known at present.

I regard Boscá's *A. hidalgi* as probably identical with *Ophiops occidentalis*, Blgr.

Synopsis of the Species.

I. European species. Usually two superposed postnasals; anterior upper temporal in contact with fourth supraocular; temporal scales smooth or very feebly keeled, usually with enlarged masseteric shield.

A. Dorsal scales pointed, with straight keels, not or but slightly larger than the laterals.

15 to 19 scales across middle of body; 9 to 14 femoral pores on each side; 19 to 22 lamellar scales under the fourth toe; hind limb not reaching axil . . . . . *A. fitzingeri*, Wiegm.

20 or 22 scales across middle of body; 12 to 16 femoral pores on each side; 21 to 23 lamellar scales under the fourth toe; hind limb reaching axil or shoulder in males . *A. morcoticus*, Bibr.

B. Dorsal scales rounded or obtusely pointed, diagonally keeled, more than twice as large as the laterals; 22 to 28 scales across middle of body; 14 to 22 femoral pores on each side; 22 to 27 lamellar scales under the fourth toe; hind limb reaching axil or beyond . . . . . *A. nigropunctatus*, D. & B.

II. African species. A single postnasal; parietal usually in contact with the upper postocular; temporal scales keeled, without enlarged masseteric shield; dorsal scales rounded or obtusely pointed, with diagonal keels, larger than the laterals.

A. A series of granules between the supraoculars and the superciliaries; dorsal scales strongly keeled.

18 to 24 scales across middle of body; 12 to 17 femoral pores on each side; 17 to 19 lamellar scales under the fourth toe; hind limb reaching collar or ear-opening. . . *A. africanus*, Blgr.

33 scales across middle of body; 9 femoral pores on each side; 24 lamellar scales under the fourth toe; hind limb barely reaching shoulder. . . . . *A. boulengeri*, Peracca.

B. Supraoculars in contact with the superciliaries; dorsal scales feebly keeled, the laterals and anterior entirely smooth.

A. alleni, Barbour.

1. ALGIROIDES FITZINGERI.

Notopholis fitzingeri, Wiegm. Herp. Mex. p. 10 (1834); Gené, Mem. Acc. Torin. i, 1839, p. 266, pl. i, fig. 2; Bonap. Icon. Faun. Ital., Amf. (1840); Gray, Cat. Liz. p. 34 (1845); De Betta, Faun. d'Ital., Rett. Anf. p. 22 (1874); Schreib. Herp. Eur. p. 449 (1875); Bedriaga, Arch. f. Nat. 1883, p. 259.

Lacerta fitzingeri, Dum. & Bibr. Erp. Gén. v, p. 194 (1839); Camer. Mon. Saur. Ital. p. 86, pl. ii, figs. 12–14 (1885).

Algiroides fitzingeri, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 405; Bouleng. Cat. Liz. iii, p. 46 (1887); Schreib. Herp. Eur., ed. 2, p. 368 (1912).

Body moderately depressed. Head small, rather strongly depressed, flat above, $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad, its depth equal to the distance between the centre of the eye and the tympanum, its length $3\frac{3}{4}$ to 4 times in length to vent in males, 4 to $4\frac{3}{5}$ times in females; snout obtusely pointed, a little shorter than the postocular part of the head. Parietal foramen present. Pterygoid teeth absent. Neck as broad as or broader than the head. The limbs just overlap in females; the hind limb reaches the elbow or between the elbow and the axil in males; foot as long as the head; digits rather short, scarcely compressed. Tail $1\frac{3}{5}$ to a little over 2 times as long as head and body, often (males) of equal thickness in the anterior half.

Nostril pierced between three or four shields; nasals forming a very short suture behind the rostral*; frontonasal broader than long; prefrontals forming a short median suture†; frontal $1\frac{2}{3}$ to $1\frac{3}{4}$ times as long as broad, as long as its distance from the end of the snout, of nearly equal width throughout; parietals $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, more or less distinctly emarginate on the outer side for the accommodation of the anterior upper temporal‡; interparietal $1\frac{1}{2}$ to $2\frac{1}{3}$

* Rostral in contact with the frontonasal in a male from Lanusei, in one from Corsica and in a male and a female from Sardinia.

† Frontonasal in contact with frontal in two females from Sardinia.

‡ Parietal divided into two by a transverse suture proceeding from the interparietal in a male from Corsica.

times as long as broad, longer than the occipital, which may be considerably broader. Four supraoculars,* first very small, second longer than third, fourth small but larger than first; 4 superciliaries, rarely 5, first often in contact with the second supraocular; a series of granules between the supraoculars and the superciliaries. Rostral narrowly separated from the nostril, or just touching it; nasal sometimes narrowly separating the nostril from the first upper labial; two small superposed postnasals; anterior loreal shorter than second; four upper labials anterior to the subocular, which is a little narrower beneath than above. A large upper temporal, in contact with the fourth supraocular, followed by one, two, or three smaller shields; temporal scales small, irregular, sometimes feebly keeled, sometimes with a large masseteric shield, and constantly with a large tympanic.

Gular scales flat, enlarged and imbricate towards the collar, 16 to 20 in a straight line between the symphysis of the chin-shields and the median collar-plate; a strong gular fold. Collar with strongly serrated edge, composed of 5 to 7 plates.

Scales on back pointed or shortly mucronate, with oblique striation and strong straight keels, on the sides equally large or but little smaller and more obtusely pointed; 15 to 18 scales across the middle of the body. Ventral plates imbricate, the posterior border obliquely truncate or rounded at the sides, in 6 longitudinal series, the median and outer series narrower than the others; 21 to 23 transverse series in males, 23 or 26 in females. Preanal plate large, bordered by a semicircle of small plates.

Upper surface of tibia with large rhombic keeled scales. 9 to 13 femoral pores on each side.† 19 to 22 lamellar scales under the fourth toe.

Caudal scales strongly keeled, pointed and shortly mucronate behind, in alternately somewhat longer and shorter whorls, the fourth or fifth of which contains 16 or 18 scales.

Greyish brown or olive to blackish above, uniform or with scattered black dots, greyish, bluish, yellow, or orange beneath.

Measurements (in millimetres):

From end of snout to vent . .	37	43
„ „ „ fore limb . .	14	14
Length of head	9	8
Width of head	6	6
Depth of head	5	4

* Only 3, the first being absent, in a specimen from Sardinia.

† Up to 14 according to Camerano.

	♂	♀
Fore limb	12	11
Hind limb	18	16
Foot	9	9
Tail	78	71

Particulars of Specimens Examined.

		1.	2.	3.	4.	5.	6.	7.
♂	Latzorbé, Sardinia	37	18	22	7	19	11–12	22
„	Sassari, „	32	15	21	5	16	11	20
♀	„ „	34	16	25	7	20	12	21
♂	Tacquisara „	37	18	22	6	19	10–11	20
„	Lanusei „	36	19	22	7	20	12	21
„	Sardinia	36	18	22	7	20	11–12	21
„	„	36	16	22	7	19	12	22
„	„	35	18	23	7	18	11	19
♀	„	44	15	25	5	18	11–12	22
„	„	43	18	26	7	20	11–12	22
„	„	40	18	25	7	18	11–10	22
„	„	28	18	24	5	19	10–9	19
♂	„ **P.M.**	39	16	21	7	17	12–11	20
♀	„ „	40	16	26	6	19	11	21
„	„ „	38	18	23	7	19	12–11	22
♂	Orezza, Corsica	37	18	22	7	19	11	19
„	„ „	32	15	23	7	18	13–12	21
„	Corsica, **P.M.**	34	16	22	6	20	11–12	22

1. Length from end of snout to vent (in millimetres). 2. Number of scales across the body. 3. Transverse series of ventral plates. 4. Plates in collar. 5. Gular scales in a longitudinal series. 6. Femoral pores (right and left if differing). 7. Lamellar scales under the fourth toe. Same explanation for the following tables, pp. 344, 347, 350.

Habitat.—This lizard, the smallest of the Lacertidæ, inhabits Sardinia and Corsica, up to an altitude of 1100 metres.

2. ALGIROIDES MOREOTICUS.

Algiroides moreoticus, Bibr. in Bory de St. Vinc. Expéd. Morée, Rept. p. 67, pl. x, fig. 5 (1835); Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 398; Bouleng. Cat. Liz. iii, p. 45 (1887); Werner, Zool. Anz. xvii, 1894, p. 256, and Verh. Zool.-bot. Ges. Wien, 1894, p. 231; Bedriaga, Zool. Anz. xvii, 1894, p. 455; Schreib. Herp. Eur., ed. 2, p. 370 (1912).

Lacerta moreotica, Dum. & Bibr. Erp. Gén. v, p. 192 (1839).

Notopholis moreotica, Bonap. Icon. Faun. Ital., Amf. (1840); Gray, Cat. Liz. p. 35 (1845); Schreib. Herp. Eur. p. 451 (1875).

Algiroides moreoticus, subsp. *doriæ*, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 404.

Body moderately depressed. Head small, rather strongly depressed, flat above, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its depth equal to the distance between the centre or the anterior corner of the eye and the tympanum, its length $3\frac{1}{2}$ to 4 times in length to vent in males, $4\frac{1}{2}$ times in females; snout obtusely pointed, a little shorter than postocular part of head. Parietal foramen present. Pterygoid teeth absent. Neck as broad as the head. The hind limb reaches the axil or the shoulder in males, the elbow in females; foot a little longer than the head; digits moderately elongate, feebly compressed. Tail $1\frac{2}{3}$ to $2\frac{1}{4}$ times as long as head and body.*

Nostril pierced between five shields; nasals forming a short suture behind the rostral; frontonasal broader than long; prefrontals forming a rather extensive median suture †; frontal $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, as long as or a little shorter than its distance from the end of the snout, of nearly equal width throughout; parietals $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, sometimes emarginate on the outer side for the accommodation of the anterior upper temporal; interparietal $1\frac{1}{2}$ to 2 times as long as broad, longer than the occipital, which is of equal breadth or a little broader. Four supraoculars, first very small, second longer than third, fourth small but larger than first; 5 superciliaries, rarely 4, first sometimes in contact with the second supraocular; a series of granules between the supraoculars and the superciliaries. Rostral entering the nostril; two small superposed postnasals, rarely one ‡; anterior loreal as long as or a little shorter than second; four upper labials § anterior to the subocular, which is a little narrower beneath the above. A large upper temporal, in contact with the fourth supraocular, followed by two or three smaller shields; temporal scales small, irregular, feebly keeled, sometimes with a large masseteric shield, and constantly with a large tympanic.

Gular scales flat, enlarged and imbricate towards the collar, 16 to 22 in a straight line in the middle; a strong gular fold. Collar with strongly serrated edge, composed of 6 to 9 plates.

Scales on back pointed, with oblique striation and strong straight

* According to Werner's measurements of several specimens from Cephalonia.

† In a male from Krani the suture between the prefrontals has disappeared.

‡ Male from Krani.

§ 5 on one side in a specimen from Cephalonia, according to Werner.

keels, on the sides equally long but narrower, obtusely pointed, and less strongly keeled; 20 or 22 scales across the middle of the body. Ventral plates imbricate, the posterior border obliquely truncate or rounded at the sides, in 6 longitudinal series, the median and outer series narrower than the others; 22 or 24 transverse series in males, 25* in females. Preanal plate large, bordered by one or two semicircles of small plates.

Upper surface of tibia with large rhombic keeled scales. 12 to 16 femoral pores on each side. 21 to 23 lamellar scales under the fourth toe.

Caudal scales strongly keeled, pointed, in alternately somewhat longer and shorter whorls, the fourth or fifth of which contains 20 to 24 scales.

Brown or reddish brown above, sides often darker; a more or less distinct light yellowish green dorsolateral streak; sides yellowish green in males, spotted or marbled with black. Lower parts yellowish green. In Bedriaga's var. *doriæ*, from Zante, the light dorsolateral streak is not so strongly marked, and the sides bear light, dark-edged small ocellar spots.

Measurements (in millimetres):

	1.	2.	3.
From end of snout to vent . . .	49	45	35
„ „ „ fore limb . .	18	17	15
Length of head	12	10	10
Width of head	8	6	6
Depth of head	6	5	4
Fore limb	16	14	13
Hind limb	25	22	19
Foot	14	12	11
Tail	—	—	68

1. ♂, Morea (type). 2. ♀, Cephalonia. 3. ♂, Zante (type of var. *doriæ*).

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Morea (type), **P.M.** . . .	49	22	24	6	16	12–13	23
„ L. Stymphalos, Morea . .	45	22	23	7	17	13	23
„ Krani, Cephalonia . . .	46	22	22	8	19	14–13	23
„ Cephalonia, **P.M.** . . .	47	22	24	7	22	14	22
„ „	41	20	22	8	17	12–13	21
♀ „	45	22	25	9	20	14–13	23
♂ Zante (var. *doriæ*) . . .	35	22	23	9	19	15–16	22

* To 29, according to Werner.

Habitat.—Originally discovered in Morea, this lizard has since been found on Cephalonia, Zante, and Ithaka.

A. moreoticus is intermediate between *A. fitzingeri* and *A. nigropunctatus*, but nearer the former.

3. ALGIROIDES NIGROPUNCTATUS.

? *Lacerta carinata*, Schinz, Naturg. Rept. p. 102, pl. xxxix (1833).

Lacerta nigropunctata, Dum. & Bibr. Erp. Gén. v, p. 190 (1839).

Notopholis nigropunctata, Bonap. Icon. Faun. Ital., Amf. (1840); Gray, Cat. Liz. p. 35 (1845); Schreib. Herp. Eur. p. 452 (1875); Tomasini, Wiss. Mitth. Bosn. Herzeg. ii, 1894, p. 581.

Lacerta schreibersii, Schinz, Eur. Faun. ii, p. 24 (1840).

Lacerta (*Notopholis*) *nigropunctata*, Ninni, Atti Soc. Ital. xxvi, 1886, p. 339, pl. viii.

Algiroides nigropunctatus, Bedriaga, Abh. Senck. Ges. xiv, 1886, p. 393; Bouleng. Cat. Liz. iii, p. 44 (1887); Werner, Verh. Zool.-bot. Ges. Wien, 1894, p. 230, and Rept. Amph. Oesterr.-Ung. p. 27 (1897); Schreib. Herp. Eur., ed. 2, p. 371 (1912).

Body strongly depressed. Head rather strongly depressed, flat above, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its depth equal to the distance between the centre of the eye and the tympanum, its length $3\frac{2}{3}$ to 4 times in length to vent; snout obtusely pointed, as long as the post-ocular part of the head. Parietal foramen present. Pterygoid teeth absent. Neck as broad as or a little narrower than the head. The hind limb reaches the shoulder or the collar in males, the axil or the shoulder in females; foot a little longer than the head; digits slender, compressed. Tail $1\frac{2}{3}$ to $2\frac{1}{3}$ times as long as head and body.

Upper head-shields sometimes rugose with fine striæ. Nostril pierced between 4 or 5 shields; nasals forming a very short suture behind the rostral; frontonasals as long as broad or, usually, a little broader than long; prefrontals usually forming an extensive median suture*; frontal $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, as long as or a little shorter than its distance from the end of the snout, a little narrower behind than in front; parietals $1\frac{1}{3}$ to $1\frac{2}{3}$ times as long as broad, often emarginate on the outer side for the accommodation of the anterior upper temporal; interparietal small†; occipital at least as large as

* Separated by a small azygos shield in a male from Corfu; frontonasal in contact with frontal in a female from the same island.

† A small shield between the interparietal and the occipital in two specimens (♂, ♀) from Gorizia; parietals forming a short suture between the two shields in the type specimen.

the interparietal,* usually longer and broader, sometimes as broad as the frontal. Four supraoculars, first very small, second usually a little longer than third, fourth small but larger than first; 6 or 7 (rarely 5) superciliaries, separated from the supraoculars by a complete series of granular scales. Rostral entering the nostril; two small superposed postnasals, exceptionally one †; anterior loreal as long as or a little shorter than second; 5, more rarely 4 ‡ upper labials anterior to the subocular, which is usually narrower beneath than above. A large anterior temporal, in contact with the fourth supraocular, followed by a series of small scales; temporal scales small, irregular, sometimes rugose and feebly keeled, often with a large masseteric shield; a curved tympanic shield.

Gular scales flat, often a little enlarged towards the collar, 17 to 22, usually 19 to 21, between the symphysis of the chin-shields and the median collar-plate; gular fold distinct. Collar with serrated edge, composed of 7 to 9, rarely 10 plates.

Dorsal scales rhombic, obtusely pointed or rounded behind, with very fine oblique striation and strong diagonal keels, converging towards the median line; lateral scales much smaller, two or three corresponding to a ventral plate; 22 to 28 scales across the middle of the body. Ventral plates scarcely imbricate, the transverse series with nearly rectilinear border, in 6 longitudinal series, the median and outer series narrower than the others; 21 to 25 transverse series. Preanal plate large, bordered by a semicircle of small plates.

Upper surface of tibia with large rhombic keeled scales. 14 to 21 femoral pores on each side §; usually 15 to 19. 22 to 27 lamellar scales under the fourth toe.

Caudal scales strongly keeled, obtusely pointed and sometimes slightly mucronate behind, in alternately somewhat longer and shorter whorls, the fourth or fifth of which contains 22 to 26 scales.

Greyish brown, coppery red, or greenish above, with metallic gloss and black dots or small spots irregularly scattered; sides often darker, with or without small light spots, sometimes (males) red like the belly. Lower parts greenish white in the females and young; males blue on the throat and orange or bright red on the belly and lower part of the flanks, often with small blue spots on the outer ventral plates.

* With one exception (male from Corfu), in which the former is slightly the larger.

† In a male from Fiume and in a male from Corfu.

‡ In 10 cases out of 50. Sometimes 6 anterior labials according to Bedriaga.

§ Up to 22 according to Werner.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From end of snout to vent . .	60	62	68	55	50
„ „ „ fore limb .	26	25	29	22	21
Length of head	16	16	18	14	13
Width of head	10	10	12	9	9
Depth of head	7	7	8·5	6·5	6
Fore limb	22	21	25	20	19
Hind limb	35	33	37	30	30
Foot	18	17	21	16	15
Tail	125	120	145	—	84

1. ♂, Gorizia. 2. ♂, Fiume. 3. ♂, Corfu. 4. ♀, Gorizia. 5. ♀, Corfu.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Gorizia	60	26	22	9	20	19	27
„ „	60	24	23	8	22	18–17	25
„ „	60	25	24	9	17	17–16	24
„ „	57	22	23	10	20	17–18	24
„ „	52	24	23	9	19	15	23
♀ „	55	26	22	8	18	16–15	25
„ „	52	24	25	8	21	16–14	24
♂ Fiume	62	24	21	9	19	16	25
„ Veglia Id.	63	22	21	8	20	15–16	22
„ Mosor Mt., Dalmatia . .	68	23	22	9	22	19–18	26
„ „ „ . .	63	24	24	9	20	17–18	24
„ „ „ . .	57	24	24	9	21	16–17	23
„ Corfu (type), **P.M.** . .	65	26	23	9	21	15–17	26
„ „ (A. Smith)* . . .	64	26	23	7	20	17–18	25
„ „ (Frett) . . .	66	28	23	7	20	16–17	25
„ „ (Werner) . . .	65	24	21	7	21	21	25
„ „ (Krause) . . .	68	28	22	7	21	17–18	24
„ „ „ . . .	66	26	24	7	22	16–18	23
♀ „ „ . . .	55	22	24	7	21	17	27
„ „ „ . . .	50	26	23	7	20	19	23
♂ „ (Mulser) . . .	61	22	23	7	18	16–18	23
„ „ „ . . .	56	22	23	7	19	17	25
♀ „ „ . . .	57	24	24	7	19	14–16	24
„ „ „ . . .	53	24	25	8	21	15	25
♂ „ (Southoff) . . .	68	28	23	10	22	19	25
„ „ „ . . .	64	24	24	9	21	17–18	27

* The specimen alluded to by Bonaparte in 1839 (Ann. Sc. Nat. [2] xii, p. 61) as having been seen by him in the Chatham Museum.

Habitat.—Gorizia, Carniola, Istria (with Cherso and Veglia Ids.), W. Croatia, Dalmatia, Herzegovina, Montenegro, Albania, Epirus, and Ionian Islands.

4. ALGIROIDES AFRICANUS.

Algiroides africanus, Bouleng. Proc. Zool. Soc. 1906, ii, p. 570, fig., and Rev. Zool. Afr. vii, 1919, p. 13; Schmidt, Bull. Amer. Mus. N. H. xxxix, 1919, p. 201, fig., pl. xxiii, fig. 1.

Adolfus fridericianus, Sternf. in Schubotz, Wiss. Ergebn. Deutsch. Z.-Afr. Exped. iv, ii, p. 220, fig. (1912).

Body rather strongly depressed. Head rather strongly depressed, flat above, $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as broad, its depth equal to the distance between the centre of the eye and the tympanum, its length $3\frac{3}{4}$ to 4 times in length to vent; snout obtusely pointed, as long as the postocular part of the head. Parietal foramen usually absent. Pterygoid teeth absent. Neck as broad as the head. The hind limb reaches the collar or the ear-opening; foot longer than the head; digits slender, compressed, the basal phalanx of the toes forming a keel. Tail $1\frac{3}{4}$ to $2\frac{1}{4}$ times as long as head and body.

Upper head-shields more or less rugose with very fine striæ; nostril pierced between two shields; nasals forming a very short suture behind the rostral or rostral in contact with the frontonasal,* which is as long as broad or a little broader; suture between the prefrontals usually short†; frontal $1\frac{2}{3}$ to 2 times as long as broad, as long as its distance from the end of the snout, narrower behind than in front; parietals $1\frac{1}{5}$ to $1\frac{1}{3}$ times as long as broad, in contact with the upper postocular‡; interparietal narrow; occipital small, shorter and often broader than the interparietal, from which it may be separated by the parietals.§ Four supraoculars, first very small, second a little longer than third, fourth larger than first; 6 or 7 superciliaries, first longest and in contact with the second supraocular; a series of granules between the supraoculars and the superciliaries. Nasal narrowly separating the nostril from the first upper labial; a single postnasal, often nearly as large as the anterior loreal, which is shorter than the second; 5, rarely 4 || upper labials anterior to the subocular, which is not or but little narrower beneath than above. Upper temporals not enlarged, or narrow and keeled; temporal scales rather small,

* In 2 specimens from Bitye, in 4 from Madje.

† A small azygos prefrontal in 3 specimens from Madje.

‡ 3 exceptions in specimens from Madje.

§ 1 specimen from Bitye, 9 from Madje.

|| On one side in the type and in 3 specimens from Madje.

rugose and strongly keeled; tympanic shield absent, or if present, narrrow.

Gular scales feebly keeled, small and juxtaposed in front, much larger and imbricate towards the collar, 19 to 29 (usually 21 to 25), between the symphysis of the chin-shields* and the median collar-plate; gular fold absent or barely indicated. Collar with feebly serrated edge, composed of 7 to 9 (rarely 6) plates, which may be faintly keeled.

Dorsal scales rhombic, obtusely pointed or rounded behind, with fine oblique striation and strong diagonal keels, converging towards the median line; lateral scales smaller, one and two or two and three corresponding to a ventral plate; 18 to 24 scales across the middle of the body. Ventral plates feebly imbricate, in 6 longitudinal series, the median and outer much narrower than the others, the outer often faintly keeled; 18 to 21 (rarely 22) transverse series. Preanal plate rather large, with one or two smaller azygos plates in front of it and small scales on the sides.

Upper surface of tibia with large rhombic keeled scales. 12 to 17 femoral pores on each side. 17 to 19 lamellar scales under the fourth toe.

Caudal scales large and broad, very strongly keeled, obtusely pointed and sometimes slightly mucronate behind, in alternately somewhat longer and shorter whorls, the fourth or fifth of which contains 14 to 18 scales.

Coppery or bronzy brown above, with metallic gloss, with a broad dark brown lateral band from the end of the snout to the base of the tail, edged above and beneath by a series of round whitish spots, which are confluent into a streak from below the eye, through the lower part of the ear-opening, to the shoulder; small black spots on the back; tail dark brown above, with regular transverse series of whitish spots or with dark and light bars. Lower parts orange in life (green in spirit), the throat yellowish.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From end of snout to vent . .	51	57	64	61	64
,, ,, ,, fore limb .	20	23	24	26	25
Length of head	14	15	17	17	17
Width of head	9	10	10	11	10
Depth of head	6	7	7	7	7
Fore limb	22	24	26	27	27

* Usually three chin-shields in contact with their fellows, as normal in the genus, but exceptionally only two, or two on one side and three on the other.

	1.	2.	3.	4.	5.
Hind limb	30	35	36	42	40
Foot	16	17	18	19	19
Tail	—	117	112	135	—

1. ♂, type, Entebbe. 2. ♂, Madje, Ituri. 3. ♀, Madje. 4. ♂, Bitye, Cameroon. 5. ♀, Bitye.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Entebbe (type) . .	51	24	18	6	19	13–15	17
,, Madje, Ituri . .	60	20	19	7	25	15	18
,, ,, ,, . .	59	20	20	7	24	15–14	18
,, ,, ,, . .	59	22	20	7	29	17	19
,, ,, ,, . .	58	20	19	8	22	14–15	18
,, ,, ,, . .	57	19	18	8	23	14	18
,, ,, ,, . .	57	19	20	8	27	16–14	19
,, ,, ,, . .	55	20	18	9	22	14–13	18
,, ,, ,, . .	55	19	19	7	21	16–17	18
,, ,, ,, . .	55	20	18	7	21	14	18
,, ,, ,, . .	54	22	21	8	24	15–14	18
,, ,, ,, . .	51	20	18	8	23	14	17
♀ ,, ,, . .	64	20	20	7	29	14	19
,, ,, ,, . .	63	21	19	8	23	13–14	19
,, ,, ,, . .	63	20	21	7	25	13	17
,, ,, ,, . .	62	22	21	8	24	16	18
,, ,, ,, . .	62	20	20	8	20	13–14	17
,, ,, ,, . .	58	20	19	8	22	14–15	18
,, ,, ,, . .	58	22	19	9	25	14–13	17
,, ,, ,, . .	58	20	19	7	25	14	17
,, ,, ,, . .	55	20	21	7	23	15	18
,, ,, ,, . .	53	20	21	7	21	14	19
,, ,, ,, . .	51	20	20	6	23	15–14	17
,, ,, ,, . .	51	20	20	7	21	13–14	18
,, ,, ,, . .	48	20	20	8	23	15–14	18
,, ,, ,, . .	45	21	21	6	23	15–14	17
,, ,, ,, . .	45	21	20	7	21	13–14	18
,, ,, ,, . .	42	20	21	7	23	15	18
,, ,, ,, . .	39	22	20	7	23	14	17
♂ Bitye, Cameroon .	61	24	22	7	27	17–15	17
,, ,, ,, .	58	22	19	8	22	13	18
♀ ,, ,, .	64	24	21	7	24	15	19
,, ,, ,, .	57	22	20	7	25	15–14	19

Most of the specimens from Madje are preserved in the Congo Museum, Tervueren.

This species, first discovered at Entebbe, Uganda, has since been found at Madje, in the Ituri district of the Belgian Congo, and in South Cameroon. Its range probably extends across the whole forest region of Africa north of the Equator.

5. ALGIROIDES BOULENGERI.

Algiroides africanus (non Bouleng.), Peracca, Ruwenzori, i, p. 167 (1909).

Algiroides boulengeri, Peracca, Atti Acc. Torin. lii, 1917, p. 351.

Body not depressed. Head feebly depressed, about 1½ times as long as broad; snout obtuse. The hind limb barely reaches the shoulder; foot a little longer than the head.

Head-shields as in *A. africanus*; 4 upper labials anterior to the subocular. Temporal scales small, flat, smooth. Gular scales smooth, small in front, much larger towards the collar, 25 in a longitudinal series; gular fold absent. Collar with serrated edge, composed of 5 broad plates.

Dorsal scales rhombic, flat, with sharp, linear, diagonal keels (10 or 12 longitudinal series); lateral scales smaller, 3 corresponding to a ventral plate; 33 scales across the middle of the body. Ventral plates in 6 longitudinal and 22 transverse series, the outer much smaller than the others. Preanal plate large, with a pair of enlarged scales in front of it and small scales on the sides.

9 femoral pores on each side. 24 lamellar scales under the fourth toe.

Upper caudal scales much longer than broad, strongly keeled and slightly mucronate, lower smooth or faintly keeled.

Pale bronze colour above, sides darker, the two shades separated by a fine blackish line; upper lip yellowish. Throat yellowish white, belly bluish white.

Measurements (in millimetres):

From end of snout to vent	58
Length of head	13
Width of head	9
Depth of head	6·5
Fore limb	22
Hind limb	31
Foot	15

This species is founded on a single female specimen from Fort Portal, Eastern side of Mount Ruwenzori, forming part of the Duke of the Abruzzi's expedition, and preserved in the Turin Museum.

6. ALGIROIDES ALLENI.

Algiroides alleni, Barbour, Proc. New Engl. Zool. Club, iv, 1914, p. 97; Schmidt, Bull. Amer. Mus. N. H. xxxix, 1919, p. 501, figs.

Differs from *A. africanus* in the following points:

Nostril pierced between the nasal, the postnasal, and the first upper labial; no granules between the supraoculars and the superciliaries; dorsal scales less strongly keeled, smooth on the nape and on the sides; 24 to 28 transverse series of ventral plates; only 4 plates in the collar. No spots on the back, but a dark vertebral streak is present.

Habitat.—North-eastern slope of Mount Kenia, East Africa.

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